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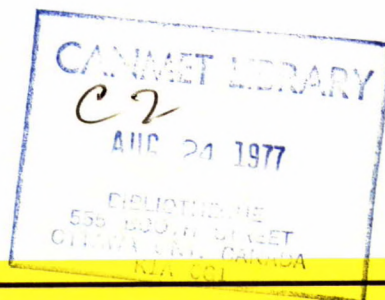
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INDEX OF COMMERCIAL FLOCCULANTS - 1974

H.A. Hamza and J.L. Picard

APRIL 1975



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OTTAWA

INDEX OF COMMERCIAL FLOCCULANTS - 1974

by

H.A. Hamza* and J.L. Picard**

ABSTRACT

The primary aim of this index is to assist the worker in selecting a range of flocculants for laboratory evaluations to optimize solid-liquid separation applications. The number of bench tests required to cover the range can be reduced to a minimum by applying the principle of pre-screening.

Information contained in the tables was acquired from the manufacturers - directly and through technical bulletins - and was supplemented by additional data as reported in the literature or obtained from bench-scale evaluation tests carried out in the Western Research Laboratory.

It is anticipated that a continuing survey of new developments in the industry will be maintained and that periodic revisions will be issued.

*Research Scientist and **Assistant Manager, Western Research Laboratory, CANMET, Department of Energy, Mines and Resources, Edmonton, Alberta, Canada.

This report relates essentially to the samples as received. The report and any related correspondence shall not be used in full or in part for publicity or advertising purposes.

UN REPERTOIRE DES FLOCULANTS COMMERCIAUX - 1974

par

H.A. Hamza* et J.L. Picard**

SOMMAIRE

La compilation de ce répertoire a été effectuée dans le but d'aider le travailleur à choisir l'assortiment de floculants le plus approprié pour obtenir les meilleurs résultats de séparation solide-liquide en laboratoire. Ainsi, en pré-sélectionnant, on réduit au minimum le nombre de ces essais.

Les renseignements contenus dans les tables proviennent des fabricants - soit directement, soit par des revues techniques - et sont joints à des données supplémentaires recueillies dans des publications ou à la suite des essais d'évaluation en laboratoire entrepris au Laboratoire de recherche de l'Ouest.

On espère pouvoir continuer l'enquête entreprise en vue de dénicher les nouvelles découvertes faites par l'industrie et ainsi les mettre à jour pour le plus grand bénéfice de tous.

*Chercheur scientifique et **Gestionnaire adjoint, Laboratoire de recherche de l'Ouest, CANMET, Ministère de l'Energie, des Mines et des Ressources, Edmonton, Alberta, Canada.

Ce rapport traite essentiellement les minerais tels que reçus. Il ne peut être employé en tout ou en partie à des fins publicitaires, de même que toute correspondance y afférente.

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INTRODUCTION

Optimization of solid-liquid separation systems in industry, whether for in-process or pollution prevention purposes, requires a thorough examination of available alternatives. For systems which require flocculants for optimum separation, an evaluation of a wide range of reagents available on the market should be carried out. However, with the rapidly increasing number of new flocculants available from various sources, routine laboratory evaluation for a given application may require many man-hours of bench testing and analyzing results. It is possible that highly suitable products may be overlooked because of the time and cost involved in thorough screening within the laboratory. Sending the material for evaluation to a specific manufacturer might also lead to incomplete results because of possible bias in favour of that company's own products.

This index was compiled within the framework of the CANMET Energy Research Program (ERP) objectives as a contribution leading to both the improvement of processing technology and finding solutions to problems arising from direct or indirect processing and use of energy resources. The tabulated information simplifies the task of pre-screening to select the most promising flocculants based on known characteristics of the system being studied and known or reported characteristics and capabilities of the flocculants. Pre-screening thus permits a large number of reagents to be evaluated while reducing to a minimum the number of tests required, a procedure that has been employed successfully in the Western Research Laboratory (WRL). It will be noted, however, that information is lacking for some of the reagents so that it is possible to overlook some which are potentially effective. Supplementary information from literature and from results of WRL bench testing has been included where possible.

This is the first attempt at a comprehensive compilation to fulfill the above aims for the mining and other industries. A number of flocculants may inadvertently have been omitted and it is hoped that, with the cooperation of the manufacturers, periodic updating with revisions and additions will be possible. To this end also, information and suggestions

are invited.

Flocculants have been listed alphabetically, first according to source and then by trade name or designation. For the present, no distinction has been made between flocculants and coagulants. Separate lists of sources and trade names have been included for easy reference. Abbreviations and symbols are defined in a list immediately preceding the tables.

The inclusion of a product in this index does not in any way imply endorsement by the Department of Energy, Mines and Resources, nor does the department accept responsibility for the accuracy of data obtained from manufacturers.* The information is intended for laboratory reference only and is not to be used in whole or in part for publicity or advertising purposes.

* Note that prices are subject to rapid change; some manufacturers declining to quote prices for this reason. The approximate costs given are probably not those at the time of publication and are included only for purposes of rough comparison.

PRE-SCREENING

The pre-screening procedure employed in WRL consists essentially of matching pH of the pulp with the desired separation process for a particular application as given in the tables on pages 8-27. This procedure has many variations and refinements which require a good understanding of flocculation and familiarity with the flocculants themselves acquired through use, through characterization in the laboratory, or through information supplied by the manufacturer.

Flocculation is influenced by many factors including solids content, nature and size distribution of the solids, nature of the liquid including dissolved ions, pH of the system, temperature, zeta-potential and others, some of which may be difficult to define. For this reason, every system is normally considered unique for purposes of formulating a treatment. For practical purposes, therefore, and in the present frame of reference, the simple approach described above is considered adequate.

Information headings under "Characteristics", "Process" and "Fields of Application" in the tables are essentially self-explanatory. It remains only to point out that because of space limitations, some of these are broad in scope: for example, "Dewatering", line 12 is a broad classification which includes filtration, centrifugation, etc. In line 7, "Specific Gravity" is given as g/ml and "Shelf Life", line 8 is expressed in months.

SOURCES OF FLOCCULANTS

Source No.

- (1) Alchem Limited, P.O. Box 5002, Burlington, Ont.
- (2) Allied Chemical Canada Ltd., 100 North Queen St., P.O. Box 65, Toronto, Ont. M8Z 5N3. (Rep. Canada Colors and Chemicals Ltd., Toronto, Ont.)
- (3) Allied Colloids (Canada) Ltd., 101 Duncan Mill Road, Don Mills, Ont. M3B 1Z3
- (4) Armour Industrial Chemicals Ltd., 100 University Ave., Toronto, Ont. M5J 1V6
- (5) BASF Canada Ltd., 5850 Cote de Liesse Rd, Town of Mount Royal, Que.
- (6) Betz Laboratories Ltd., 75 Hymus Blvd, Pointe Claire, Que.
- (7) The Burtonite Co., Inc., Nutley, N.J., U.S.A. (Rep. Van Waters and Rogers Ltd.)
- (8) Calgon Canada, 185 Eileen Ave., P.O. Box 69, Station D, Toronto, Ont.
- (9) Canada Colors and Chemicals Ltd., Toronto, Ont.
- (10) Cyanamid of Canada Ltd., 1 City View Drive, Rexdale, Ont.
- (11) Dearborn Chemical Co. Ltd., 3451 Erindale Station Rd, Mississauga, Ont.
- (12) Dow Chemical of Canada Ltd., Modeland Road, P.O. Box 1012, Sarnia, Ont. N7T 7K7
- (13) General Mills Chemicals, Inc., Tucson, Arizona, U.S.A.
- (14) B.F. Goodrich Chemical Canada, Kitchener, Ont.
- (15) GAF Corporation, New York, N.Y., U.S.A. (Rep. Chemical Developments of Canada Ltd., 104 Doyon Ave., Pointe Claire, Que.)
- (16) Hercules Canada Ltd., 1980 Sherbrooke St., W., Montreal, Que. (Rep. Harrisons & Crosfield [Canada] Ltd., Toronto, Ont.)
- (17) Hodag International S.A., Inc., Skokie, Illinois, U.S.A.
- (18) Hoechst Chemicals, Montreal, Que.
- (19) Kelco Company, Clark, N.J., U.S.A. (Rep. Charles Tennant & Company [Canada] Ltd., 34 Clayson Rd., Weston, Ont.)
- (20) National Silicates Ltd., P.O. Box 69, Toronto 14, Ont.
- (21) National Starch & Chemical Co. (Canada) Ltd., 2125 Remembrance St., Lachine, Que.
- (22) Pennwalt of Canada Ltd., 700 Third Line, Oakville, Ont.

Source No.

- (23) Rohm and Haas Canada Ltd., 2 Manse Road, West Hill, Ont.
M1E 3T9
- (24) Sandoz Colours and Chemicals, P.O. Box 385, Dorval, Que.
- (25) A.E. Staley Mfg. Co., Decatur, Illinois, U.S.A.
- (26) Stein-Hall Ltd., West Hill, Ont.
- (27) Tar Residuals Ltd., Cheadle Heath, Stockport, Cheshire, Eng.,
(Rep. Bate Chemical Co. Ltd., 160 Lesmill Rd, Don Mills, Ont.)
- (28) Union Carbide Canada Ltd., Toronto, Ont.

FLOCCULANT TRADE NAMES/DESIGNATIONS

Trade Name or Designations	Source No.	Table Page No.	Trade Name or Designations	Source No.	Table Page No.
Aerofloc	10	15	Nalco	1	8
Alchem	1	8	Nalcolyte	1	8,9
Alfloc	1	8	Natron	21	23
Alum	2	9	Pearl Starch	25	25
Aquafloc	11	17	PEI	12	18
Arquad	4	11	Percol	3	10
Bozefloc	18	22	Poly-floc	6	12
Burtonite	7	12	Polyhall	26	26
CA	8	13	Polymer	6	12
Cartaretin	24	25	Polymer	28	27
Cat-floc	8	13	Polyox	28	27
Dow Strength Resin	12	19	PQ N-Sol	20	23
			Primafloc	23	24
Duomac	4	11	Purifloc	12	18
Ferric Chloride	22	24	Reagent	10	16
Ferri-floc	9	14	Sandofix	24	25
Flocs	17	21	Sedipur	5	11
Gantrez AN	15	20	Separan	12	18
Good-Rite	14	20	SPX	16	21
Guartec	13	19	Superfloc	10	16
Hamaco	25	25	TR	27	27
Hercofloc	16	21	Tydex	12	19
Jaguar	26	26	Vinrez	26	26
Kelco	19	22	WT	8	13,14
Kelgin	19	22	XD	12	19
Kelzan	19	22			
Klar-Aid	11	17			
M	8	13			
Magnifloc	10	15,16			
MRL	26	26			

ABBREVIATIONS AND SYMBOLS USED IN TABLES

A	Anionic compound	PS +	Modified polysaccharide
A/C	Amphoteric compound	PVP	Polyvinyl pyrrolidone
ADA	Alkyl diamine acetate	QAC	Quaternary ammonium compound
ALG	Algin	VH	Mol Wt: $5 \times 10^6 - 15 \times 10^6$
C	Cationic compound	vh	Very high degree of charge
C.C.D.	Counter-current decantation	VL	Mol Wt: $< 10^3$
EH	Mol Wt: $> 15 \times 10^6$	vl	Very low degree of charge
GG	Guar Gum	XAN	Xanthan
h	High degree of charge	x	Successful application reported
H	Mol Wt: $10^5 - 5 \times 10^6$	-	Not applicable
IN	Inorganic	*	Potable water grade available
Ind.	Indefinite shelf life		
L	Mol Wt: $10^3 - 10^4$		A blank indicates information is unknown or unavailable
LI	Supplied in liquid form		
lo	Low degree of charge		
MVE	Methyl vinyl ether-maleic anhydride co-polymer		
M	Mol Wt: $10^4 - 10^5$		
m	Medium degree of charge		
N	Non-ionic compound		
NACS	Sodium cellulose sulphate		
P	Supplied in powder form		
Pa	Supplied in paste form		
PA	Polyamine type		
PAA	Polyacrylic acid		
PAC	Polyacrylate		
PAM	Polyacrylamide		
PAN	Polyacrylonitrile		
PEI	Polyethyleneimine		
PEO	Polyethylene oxide		
PS	Polysaccharide		

		ALCHEM LTD.																											
		Alchem			Alflac								Nalco					Nalcolyte											
		600	633 HD	636 HD	4150	4151	4153	4154	4155	8863	82070	603	623	634	635	680	81009 ²⁾	110A	607	610	670	671	673	674	675H	8170	8172		8173
CHARACTERISTICS	Charge	C	A	C	N	A	A	A	A	A	N	C	A	C	A	A	A	N	C	C	N	A	A	A	A	N	A	A	
	Activity	h	la	la	-	vh	vh	vh	vh	vh	-	h	vh	h	h	-	-	-	h	h	-	la	vh	h	vh	-	lo	vh	
	Type	PA		PAM	PAM	PAM	PAM	PAM	PAM	PAM	PEI	PAM	PA	PAM	IN ¹⁾	PAM	PS+ ³⁾	PA	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM
	Mol Weight			H	H	H	H	H	VR	H	M				230		H		H	VH	VH	VH	VH	VH	VH	H	H	H	
	Form	LI	P	P	P	P	P	P	LI	LI	LI	LI	LI	P	P	LI	P	LI	P	P	P	P	P	P	P	P	LI	P	
	pH	8.5	7.8	6.8	8.5	8.2	8.2	7.8	7.8	8.2	6.7	6.5	7.2	6.0	8.3	11.6	9.5	8.5	7.2	5.1	6.9	6.5	8.2	8.8	8.2	8.0	7.6	7.6	
	Sp Gravity	1.07	0.70	0.83	0.80	0.66	0.88	0.77	0.77	1.04	1.01	1.18	1.02	1.18	0.72	0.80		0.40	1.17	0.72	0.69	0.54	0.87			0.72	1.01	0.70	
	Shelf Life	Ind.	12	12	12	12	12	12	12	6	6	12	6	6	12	6		12	12	12	12	12	12	12		12	6	12	
PROCESS	pH Range	4-10		4-10	6-12	0-7	6-14	6-14	8-14	6-14	0-7	4-9	4-10	4-9	> 2	4-11		7-9	4-13	4-10	0-14	0-9	6-14			0-6	5-10	5-10	
	Clarification	x			x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x	x			x	x	x	
	Thickening					x	x	x	x	x	x	x	x	x					x	x	x		x	x					
	Dewatering	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x		x			x	
	C.C.D.	-	-	-	-	x						-	-	-	-	-			-	-	x		x			-	-	-	
FIELDS OF APPLICATION	Brines				x	x	x	x	x	x											x								
	Chem Plant	x	x		x		x	x	x	x											x								
	Clay											x																	
	Coal						x	x													x								
	Food									x																			
	Ind Minerals													x															
	General Mining				x	x	x																						
	Ferrous		x		x	x				x	x																		
	Non-Ferrous	x			x	x				x	x																		
	Oil Refinery	x																											
	Paint/Pigment																												
	Phosphate										x	x									x								
Pulp/Paper	x	x	x										x	x	x														
Sewage	x																			x	x	x							
Silica																													
Steel Mill	x			x		x	x	x	x	x																			
Tannery/Textile																													
Water																													
General	x			x	x	x	x	x	x	x	x		x							x	x	x	x	x					
Potable	-			-	-	-	-	-	-	-	-	-	-	-	-	-				-	-	-	-	-					
Cost, \$/lb	0.70	1.00	1.25	0.93	1.14	1.08	1.30		0.90	0.90	0.74	0.82	0.54	2.00	0.31		0.70	0.80	2.58	1.50	2.48	1.90	2.25	1.87	1.95	1.06	2.00		

1) Sodium Aluminum Trihydrate, 2) Developmental Reagent, 3) Modified Starch

		ALCHEM LTD. (cont.)									
		Malcolyte									
		8174	8175								
1	Charge	A	A								
2	Activity	vh	vh								
3	Type	PAM	PAM								
4	Mol Weight	VH	H								
5	Form	LI	P								
6	pH	8.4	8.2								
7	Sp Gravity	1.03	0.77								
8	Shelf Life	12	12								
9	pH Range	7-14	8-14								
10	Clarification	x	x								
11	Thickening										
12	Dewatering	x	x								
13	C.C.D.	-	-								
14	Brines										
15	Chem Plant										
16	Clay										
17	Coal										
18	Food										
19	Ind Minerals										
20	General										
21	Ferrous										
22	Non-Ferrous										
23	Oil Refinery										
24	Paint/Pigment										
25	Phosphate										
26	Pulp/Paper										
27	Sewage										
28	Silica										
29	Steel Mill										
30	Tannery/Textile										
31	Water General		x								
32	Water Potable	x	x								
33	Cost, \$/lb	1.12	2.00								

		ALLIED CHEMICAL CANADA, LTD.									
		Alum									
1	Charge	C									
2	Activity	-									
3	Type	IN ¹⁾									
4	Mol Weight	594									
5	Form	P/LI									
6	pH	3.4									
7	Sp Gravity	1.08									
8	Shelf Life	Ind.									
9	pH Range	5-8 ²⁾									
10	Clarification	x									
11	Thickening	x									
12	Dewatering	-									
13	C.C.D.	-									
14	Brines										
15	Chem Plant										
16	Clay										
17	Coal	x									
18	Food	x									
19	Ind Minerals										
20	General	x									
21	Ferrous	x									
22	Non-Ferrous										
23	Oil Refinery										
24	Paint/Pigment										
25	Phosphate										
26	Pulp/Paper	x									
27	Sewage	x									
28	Silica										
29	Steel Mill	x									
30	Tannery/Textile	x									
31	Water General	x									
32	Water Potable	x									
33	Cost, \$/lb	0.03									

1) Al₂(SO₄)₃

2) Also pH > 10.5

		ALLIED COLLOIDS (CANADA) LTD.																									
		Percol																									
		139	140	155	156	292	351	352	388	455	511	728	751	763	794	E24	HRL20										
1	Charge	A	C	A	A	C	N	C	C	C	A	C	C	C	C	A	C										
2	Activity	vl	lo	lo	m	m	-	lo	h	vl	h	m	h	h	h	vl	h										
3	Type	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PA	PAM		PAM	PA	PAM	PA	PAM	PA										
4	Mol Weight	H	H	VH	VH	H	VH	VH	L	VH	EH	VH	L	H	L	VH	L										
5	Form	P	P	P	P	P	P	P	LI	P	P	P	LI	P	LI	P	LI										
6	pH	4.6	5.0	6.2	6.8	5.0	5.3	5.9	4.0	5.5	6.2	5.5	5.3	4.0	8.7	4.5	4.4										
7	Sp Gravity	0.56	0.56	0.56	0.56	0.56	0.56	0.50	1.04	0.56	0.56	0.56	1.06	0.56	1.06	0.56	1.06										
8	Sheif Life	Ind.	Ind.	Ind.	Ind.	Ind.	Ind.	Ind.	12	Ind.	Ind.	Ind.	6	Ind.	6	Ind.	12										
9	pH Range	7-12	1-12	7-12	7-12	1-12	1-12	1-12 ¹⁾	1-12	1-12	7-12	1-12	1-12	1-12	1-12	7-12	1-12										
10	Clarification	x	x	x	x	x	x	x	x	x	x					x	x										
11	Thickening	x	x	x	x	x	x	x	x	x																	
12	Dewatering	x	x	x	x	x	x	x	x	x																	
13	C.C.D.		-					x	-																		
14	Brines				x		x																				
15	Chem Plant															x											
16	Cloy							x																			
17	Cool				x		x	x		x						x	x										
18	Food																										
19	Ind Minerals																										
20	General																										
21	Mining Ferrous	x						x	x																		
22	Non-Ferrous	x	x	x	x			x	x		x	x				x											
23	Oil Refinery																										
24	Paint/Pigment																										
25	Phosphate				x			x	x																		
26	Pulp/Paper		x		x	x	x		x							x											
27	Sewage											x	x	x	x												
28	Silica	x																									
29	Steel Mill							x																			
30	Tannery/Textile																										
31	Water General	x	x	x	x	x	x	x	x							x	x										
32	Potable	-	*	*	*	*	*	*	-	-	-	-	-	-	-	-	-										
33	Cost, \$/lb	1.10	1.40	1.10	1.10	1.30	1.10	1.10	0.40	1.10	1.32	1.60	0.30	1.60	0.30	1.35	0.30										

* Equivalent Potable Water Grade Available
1) Especially acid range

		ARMOUR INDUSTRIAL CHEMICALS LTD.														
		Arquad			Duomac											
		S-50	T-2C	2HT/75	T											
1	CHARACTERISTICS	Charge	C	C	C	C										
2		Activity	-	-	-	-										
3		Type	QAC	QAC	QAC	ADA										
4		Mol Weight	VL	VL	VL	VL										
5		Form	LI	LI	Pa	Pa										
6		pH	6.5	6.5	7.5											
7		Sp Gravity	0.89	0.87	0.88	0.84										
8		Shelf Life	12+	12+	12+											
9	PROCESS	pH Range	wide	wide	wide											
10		Clarification	x	x	x	x										
11		Thickening		x	x											
12		Dewatering			x											
13	C.C.D.	-	-	-												
14	FIELDS OF APPLICATION	Brines														
15		Chem. Plant														
16		Clay	x	x	x											
17		Coal														
18		Food			x											
19		Ind Minerals	x													
20		Mining	General													
21			Ferrous	x	x	x										
22			Non-Ferrous	x		x										
23		Oil Refinery														
24		Paint/Pigment														
25		Phosphate														
26	Pulp/Paper			x												
27	Sewage	x														
28	Silica	x	x	x	x											
29	Steel Mill															
30	Tannery/Textile	General	x	x	x	x										
31		Water														
32	Potable	-	-	-												
33	Cost, \$/lb	0.65	0.72	0.40	0.52											

		BASF CANADA LTD.														
		Sedipur														
		KA	T1	TF2	TF5	TF7	TF Solid									
1	CHARACTERISTICS	Charge	C	A	A	A	A	N								
2		Activity		h	m	h		-								
3		Type	PEI	PAM	PAM	PAM	PAM	PAM								
4		Mol Weight	M													
5		Form	LI	P	P	P	P	P								
6		pH	6.7	8.2	7.2	8.0	8.1	6.4								
7		Sp. Gravity														
8		Shelf Life														
9	PROCESS	pH Range	7-14	7-14	7-14	7-14	7-14	0-14								
10		Clarification	x	x		x	x	x								
11		Thickening							x							
12		Dewatering							x							
13	C.C.D.															
14	FIELDS OF APPLICATION	Brines														
15		Chem. Plant														
16		Clay														
17		Coal				x			x							
18		Food				x										
19		Ind Minerals		x			x									
20		Mining	General													
21			Ferrous				x	x	x							
22			Non-Ferrous				x									
23		Oil Refinery														
24		Paint/Pigment														
25		Phosphate														
26	Pulp/Paper	x														
27	Sewage															
28	Silica															
29	Steel Mill				x	x	x	x								
30	Tannery/Textile	General	x	x		x										
31		Water														
32	Potable	-	-	-												
33	Cost, \$/lb	0.65	1.30	1.30	1.30	1.30	1.30	1.30								

		BETZ LABORATORIES LTD.											
		Poly-floc									Polymer		
		1100	1110	1120	1130	1140	1150	1160	1170	1175	1190	LG-5	
1 2 3 4 5 6 7 8	CHARACTERISTICS	Charge	A	A	A	A	N	C	C	C	C	C	N
		Activity	lo	m	vh	-	-	h	h	h	h	h	-
		Type	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PA	PA		PAM
		Mol Weight	VH	VH	EH	H	H	VH	VH	H	H		VH
		Form	P	P	P	P	P	P	P	LI	LI		P
		pH	7.0	6.9	7.8		5.4	8.3	6.9	8.7	8.8	6.4	7.1
		Sp Gravity	0.58	0.58	0.58	0.58	0.61	0.45	0.45	1.04	1.08	1.11	0.58
		Shelf Life	12	12	12	12	12	12	12	3	3	6	12
9 10 11 12 13	PROCESS	pH Range	wide		7-14	7-14	6-7	0-7	0-7				
		Clarification	x	x	x	x	x	x	x	x	x	x	
		Thickening	x	x	x	x	x	x	x	x	x	x	
		Dewatering					x	x	x	x	x		
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	FIELDS OF APPLICATION	Brines	x	x									
		Chem. Plant		x									
		Clay			x		x						
		Coal	x		x		x					x	
		Food											
		Ind Minerals			x								
		General											
		Mining											
		Ferrous	x	x								x	
		Non-Ferrous	x	x				x	x			x	
		Oil Refinery											
		Paint/Pigment											
Phosphate			x								x		
Pulp/Paper					x	x	x						
Sewage	x	x				x	x			x	x		
Silica													
Steel Mill	x	x			x						x		
Tannery/Textile													
Water													
General	x	x	x	x	x	x		x	x	x	x		
Potable	-	-	-	-	-	-		-	-	-	-		
33	~ Cost, \$/lb	1.65	1.65	1.65	1.65	1.82	1.82	1.82	0.52	0.65	0.83	1.82	

		THE BURTONITE CO. INC.										
		Burtonite										
		#78										
1 2 3 4 5 6 7 8	CHARACTERISTICS	Charge	N									
		Activity	-									
		Type	GG									
		Mol Weight	M									
		Form	P									
		pH	6.9									
		Sp Gravity										
		Shelf Life	Ind.									
9 10 11 12 13	PROCESS	pH Range	0-6									
		Clarification	x									
		Thickening	x									
		Dewatering	x									
		C.C.D.										
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	FIELDS OF APPLICATION	Brines	x									
		Chem Plant	x									
		Clay	x									
		Coal	x									
		Food	x									
		Ind Minerals										
		General	x									
		Mining										
		Ferrous	x									
		Non-Ferrous	x									
		Oil Refinery	x									
		Paint/Pigment										
Phosphate	x											
Pulp/Paper	x											
Sewage	x											
Silica												
Steel Mill												
Tannery/Textile												
Water												
General												
Potable	x											
33	~ Cost, \$/lb	0.36										

		CALGON CANADA																										
		CA												Cat-Floc						M						WT		
		18	233	243	253	2254	2256	2260	2270	2300	2350	2400	2425	-	B	T	500	503	510	520	530	550	560	570	580	590	2570	2580
CHARACTERISTICS	Charge	A	N	A	A	C	C	C	C	N	A	A	A	C	C	C	C	C	C	C	N	A	A	A	A	C	C	
	Activity	lo	-	vh	m	h	h	m	lo	-	m	h	vh	vh	vh	lo	vh	vh	h	m	m	-	lo	h	h	vh	lo	m
	Type	IN 1)	PAM	PAM	PAM	PA	PAM	PAM	PAM	PAM	PAM	PAM	PA	PA		PA	PA	PEI	PAM	PAM	PAM	PAM	PAM	PAM	PAM			
	Mol Weight	L																										
	Form	P	P	P	P	LI	P	P	P	P	P	P	LI	LI	LI	LI	LI	LI	LI	P	P	P	P	P	P	P	P	P
	pH	9.6	7.0	7.0	7.0	6.8	6.4	6.7	7.3	7.0	7.0	7.0	7.0	4.2	3.3	3.5	4.2		8.4		4.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0
	Sp Gravity	1.00	0.36	0.36	0.36	1.02	0.36	0.36	0.36	0.36	0.36	0.36	0.36	1.02	1.02	1.03	1.02		1.12		0.36	0.43	0.36	0.36	0.36	0.36	0.36	0.36
	Shelf Life																											
PROCESS	pH Range	wide	wide			wide	wide	wide	wide	wide			0-14	0-14	0-14	wide		wide		wide	wide	wide	wide	wide	wide	wide	wide	
	Clarification	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x	
	Thickening																x		x		x	x	x	x	x	x	x	
	Dewatering					x								x	x	x	x		x		x	x	x	x	x	x	x	
	C.C.D.	-																										
FIELDS OF APPLICATION	Brines																											
	Chem Plant																											
	Clay																											
	Coal													x	x	x									x			
	Food																											
	Ind Minerals																											
	General																											
	Mining																											
	Ferrous																											
	Non-Ferrous																											
	Oil Refinery																											
	Paint/Pigment																											
	Phosphate																											
Pulp/Paper																												
Sewage																										x	x	
Silica																												
Steel Mill																												
Tannery/Textile																												
Water	General	x				x	x	x	x	x	x	x								x	x	x	x	x	x	x	x	
	Potable	x	x	x	x	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	
~ Cost, \$/lb																												

1) Processed clay

		CALGON CANADA (cont.)										
		WT										
		2600	2630	2635	2640	2680	2690	2700	2860	2870	2900	3000
1	Charge	C	C	C	C	C	N	A	C	C	A	A
2	Activity	h	vh	m	vh		-	m	h	vh	h	vh
3	Type				PAH		PAH	PAH			PAH	PAH
4	Mol Weight											
5	Form	P	P	LI	LI	LI	P	P	LI	LI	P	P
6	pH	4.0	4.0	6.8	6.8	10.8	7.0	7.5	3.5	4.2	7.0	7.5
7	Sp Gravity	0.36	0.36	1.03	1.02	1.01	0.36	0.36	1.02	1.02	0.36	0.36
8	Shelf Life											
9	pH Range	wide	wide	wide	wide	3-8	wide	wide	wide	wide	wide	wide
10	Clarification											
11	Thickening	x	x	x	x	x	x	x	x	x	x	x
12	Dewatering	x	x	x	x	x	x	x	x	x	x	x
13	C.C.D.											
14	Brines											
15	Chem Plant											
16	Clay											
17	Coal											
18	Food											
19	Ind Minerals											
20	Mining General											
21	Mining Ferrous											
22	Mining Non-Ferrous											
23	Oil Refinery											
24	Paint/Pigment											
25	Phosphate											
26	Pulp/Paper											
27	Sewage	x	x	x	x	x	x	x	x	x	x	x
28	Silica											
29	Steel Mill											
30	Tannery/Textile											
31	Water General	x	x	x	x	x	x	x	x	x	x	x
32	Water Potable											
33	~ Cost, \$/lb											

		CANADA COLOURS AND CHEMICALS LTD.										
		Ferri-Floc										
		-										
1	Charge	C										
2	Activity	-										
3	Type	IN 1)										
4	Mol Weight	454										
5	Form	P										
6	pH											
7	Sp Gravity											
8	Shelf Life	Ind.										
9	pH Range	0-14										
10	Clarification	x										
11	Thickening											
12	Dewatering											
13	C.C.D.	-										
14	Brines											
15	Chem Plant	x										
16	Clay	x										
17	Coal											
18	Food	x										
19	Ind Minerals											
20	Mining General											
21	Mining Ferrous											
22	Mining Non-Ferrous											
23	Oil Refinery	x										
24	Paint/Pigment											
25	Phosphate											
26	Pulp/Paper	x										
27	Sewage	x										
28	Silica											
29	Steel Mill											
30	Tannery/Textile											
31	Water General	x										
32	Water Potable											
33	~ Cost, \$/lb	0.10										

1) Fe₂(SO₄)₃ 3 H₂O

		CYANAMID OF CANADA LTD.																													
		Aerofloc					Magnifloc																								
		550	3425	3453	521-C	560-C	573-C	575-C	577-C	579-C	581-C	820-A	835-A	836-A	837-A	845-A	846-A	847-A	860-A	865-A	870-A	875-A	900-N	901-N	902-N	905-N	971-N	972-N			
1	CHARACTERISTICS	Charge	A	A	A	C	C	C	C	C	C	A	A	A	A	A	A	A	A	A	A	A	N	N	N	N	N	N	1		
2		Activity	vh	vh	h				h	h		m	h	m	lo				lo	lo	vh	vh	-	-	-	-	-	-	2		
3		Type	PAN	PAN	PAM	PA	PAM	PA	PA	PA	PA	PAM	PAM	PAM	PAM				PAM	PAM	PAN	PAN	PAM	PAM	PAM	PAM	PAM	PAM	PAM	3	
4		Mol Weight	M	M	VH	M		M	M	M	M	VH	EH	EH	EH				H	H	M	M	H	VH	VH	VH	EH	VH	H	4	
5		Form	P	P	P	LI	P	LI	LI	LI	LI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	5	
6		pH	7.3			4.8		7.0	7.0	6.5	6.5		3.6	7.0	6.8	5.4				4.1	3.8	7.5	7.5	4.8	4.8	4.8	6.3	5.0	5.0	6	
7		Sp Gravity				1.16		1.16		1.16										0.54	0.54			0.48			0.46	0.48	0.48	7	
8		Shelf Life	12			6	12	6		6			12	12	12	12				12	12	12	12							8	
9	PROCESS	pH Range	5-12	5-12	3-10	wide	3-10	4-10	wide	wide		wide	wide	wide	wide				3-10	3-10	5-12	wide	3-10				3-10	3-10	3-10	9	
10		Clarification	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	10
11		Thickening	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	11
12		Dewatering	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	12
13		C.C.D.	x																												13
14	FIELDS OF APPLICATION	Brines																											14		
15		Chem Plant	x			x		x	x	x	x													x						15	
16		Clay											x	x	x	x	x	x					x							16	
17		Coal	x	x	x							x	x	x	x	x	x	x					x							17	
18		Food	x			x		x	x	x						x	x	x					x	x	x	x	x	x	x	18	
19		Ind Minerals	x	x																x										19	
20		General	x	x		x																								20	
21		Ferrous	x	x	x	x						x																		21	
22		Non-Ferrous	x	x	x							x												x						22	
23		Oil Refinery				x	x	x	x	x	x																			23	
24		Paint/Pigment																												24	
25		Phosphate																												25	
26	Pulp/Paper																		x				x	x	x		x	x	26		
27	Sewage	x			x	x	x	x	x	x	x	x	x	x	x														27		
28	Silica																						x						28		
29	Steel Mill											x	x	x	x	x	x	x	x	x	x								29		
30	Tannery/Textile																												30		
31	Water				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	31		
32	Potable	-	-	-	x	-	x	x	x	-	-	-	-	-	-	x	x	x	x	-	-	-	-	-	-	-	-	-	32		
33	~ Cost, \$/lb	0.60			0.24	1.78	0.33	0.26	0.36	0.27	0.42	2.26	1.52	1.52	1.52	1.82	1.82	1.82	1.92	1.56	0.78	0.76	1.36				1.86		33		

		CYANAMID OF CANADA LTD. (cont.)																													
		Magnifloc			Reagent			Superfloc																							
		985-N	990-N	E323A	S3731	S3732	S3757	16	20	84	127	202	206	210	212	214	220	310	330	A100	A110	A130	A150	C100	C110	N100					
CHARACTERISTICS	Charge	N	N	C				N	N	N	N	A	A	A	A	A	C	C	A	A	A	A	C	C	N						
	Activity	-	-				-	-	-	-	m	h	lo	m	h	m			lo	m	h	h			-						
	Type	PAM	PAM	PA			PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PA	PA	PAM	PAM	PAM	PAM	PAM	PAM	PAM						
	Mol Weight	VH	H				H	VH	VH	EH	VH	EH	EH	EH	EH	EH	M	M			H										
	Form	P	P	LI	P	LI	LI	P	P	P	P	P					P	LI	LI	P	P	P	P	P	P						
	pH	5.0	5.0		6.3	8.3	8.5	4.5	6.6	6.6	6.3	3.5		5.4	6.8	7.0	6.6	4.8	7.0	6.1	6.8	7.7	7.8	9.0	8.4	5.8					
	Sp Gravity	0.46	0.48	1.00				0.48										1.16	1.16												
	Shelf Life			5								12	12	12	12	12		6	6		12	12	12			12					
PROCESS	pH Range	3-10	3-10				2-10	3-10	3-10	3-10	wide	wide	wide	wide	wide	0-10		4-10	4-10	4-10	4-10	4-10	4-10	acid	acid	0-14					
	Clarification	x	x	x			x	x	x	x	x						x	x	x	x	x	x	x	x	x	x					
	Thickening	x	x	x			x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x					
	Dewatering	x	x				x	x	x	x	x		x	x	x			x	x	x	x	x	x	x	x	x					
	C.C.D.	-					x		x	x	x						-						x		x	x					
FIELDS OF APPLICATION	Brines												x																		
	Chem Plant						x	x	x	x						x	x	x							x						
	Clay						x						x	x	x																
	Coal	x			x		x	x	x	x	x		x	x	x				x			x			x						
	Food	x	x				x	x									x				x										
	Ind Minerals																														
	General	x							x	x								x													
	Mining						x		x	x	x	x					x	x													
	Ferrous						x	x	x	x	x	x																			
	Non-Ferrous			x			x	x	x	x	x		x							x	x			x	x	x					
	Oil Refinery																		x	x											
	Paint/Pigment																														
Phosphate	x					x	x	x	x						x							x	x	x	x						
Pulp/Paper	x	x																													
Sewage						x	x							x			x	x				x	x	x	x						
Silica			x			x													x												
Steel Mill						x			x	x				x		x															
Tannery/Textile						x				x													x								
Water																															
General						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
Potable	x	x				x	x	x	x	-	-	-	-	-	-	-	-	-	*	*	*	*	*	*	*						
Cost, \$/lb	2.21	1.67	0.08				1.18	1.18	1.22	1.22	1.18								1.25	1.22	1.06	0.36	0.36	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88

		DEARBORN CHEMICAL COMPANY LTD.																								
		Aquafloc										Klar-Aid														
		430	431	462	463	464	465	466	467	468	15	19	21	27												
1	Charge	C	C	A	N	C	A	A	A	A												A/C			A	
2	Activity			lo	-		lo	m	h	lo																
3	Type	PA				PAM																				
4	Mol Weight			H	H		VH	VH	VH	H															H	
5	Form	LI	LI	P	P	P	P	P	P	P												P	LI	LI	P	
6	pH	13	7			8																9.4	7	4.5	11.2	
7	Sp Gravity	1.42	1.12	0.67	0.61	0.67	0.67	0.64	0.64	0.67												1.03	1.01	1.01	0.78	
8	Shelf Life						long	long	long																	
9	pH Range							6-14	6-14																	
10	Clarification	x	x	x	x	x	x	x	x	x												x	x	x	x	
11	Thickening	x	x	x	x		x	x	x																x	
12	Dewatering	x		x	x	x	x	x	x	x															x	
13	C.C.D.																									
14	Brines			x	x		x																			
15	Chem Plant																									
16	Clay			x	x		x															x				
17	Coal																									
18	Food																									
19	Ind Minerals																					x				
20	General		x	x	x		x	x	x																x	
21	Ferrous																									
22	Non-Ferrous																									
23	Oil Refinery																									
24	Paint/Pigment																									
25	Phosphate																									
26	Pulp/Paper			x	x		x	x	x																x	
27	Sewage							x	x																x	
28	Silica																									
29	Steel Mill		x																							
30	Tannery/Textile																									
31	General	x		x	x		x	x	x														x	x	x	
32	Potable	-	-	-	-	-	-	-	-	-													-	-	-	
33	Cost, \$/lb																									

		DOW CHEMICAL OF CANADA, LTD.																												
		PEI			Purifloc									Separan																
		600	1000	1090	N11	N12	N17	N20	A22	A23	C31	C32	C41	PG 2	PG5	CP 7	NP 10	NP 20	AP 30	AP 45	AP273	MGL	MG200	MG250	MG300	MG500	MG700			
1	Charge	C	C	C	N	N	N	N	A	A	C	C	C	A	A	C	N	N	A	A	A	N	A	A	A	A	A			
2	Activity				-	-	-	-	m	m				lo	vl		-	-	h	m	h	-	lo	lo	lo	h	vh			
3	Type	PEI	PEI	PA	PAM	PAM	PAM	PAM	PAM	PAM	PEI	PEI	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM			
4	Mol Weight	M	M	M	H	H	H	H	H	H	M	M	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H			
5	Form	LI	LI	LI	P	P	P	P	P	P	LI	LI	LI	P	P	LI	P	P	P	P	P	P	P	P	P	P	P			
6	pH	10.0	9.8	7.6	7.3	7.8	6.8	8.0	10.3	10.1	8.0	9.0	8.5	7.1	7.0	8.8	6.9	7.4	10.0			10.1	7.2	7.6	7.4	7.9	10.2	10.0		
7	Sp Gravity	1.05	1.06	1.14	0.51	0.51	0.50	0.50	0.62	0.74	1.16	1.07	1.00			1.00	0.51	0.51	0.62			0.76	0.51	0.51	0.51	0.51	0.62	0.76		
8	Shelf Life			12	12	12	12	6	12	12	12		6	6	6	6	6	12	24	24	24	3	6	6	6	24	24			
9	pH Range	0-8.5	0-8.5	0-8.5	0-14	1-14	1-14	1-14	6-14	6-12	0-8.5	0-8.5	0-8.5	4-6	4-6	4-8	0-14	0-14	7-14	5-14	6-14	0-14	1-14	0-14	3-13	7-12	7-12			
10	Clarification	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x		x	x	x	x	x	x	x			
11	Thickening	x	x	x	x	x	x		x	x	x	x					x	x	x		x	x	x	x	x	x	x			
12	Dewatering	x	x	x	x	x	x		x	x	x	x				x	x	x	x		x	x	x	x	x	x	x			
13	C.C.D.																					x	x	x						
14	Brines				x				x	x	x						x	x	x		x	x	x	x	x	x	x			
15	Chem Plant				x	x	x		x	x	x						x	x	x		x	x	x	x	x	x	x			
16	Clay					x	x						x			x	x	x			x	x								
17	Cool				x	x	x			x								x	x		x	x	x	x	x	x	x			
18	Food			x					x		x								x											
19	Ind Minerals					x	x				x						x	x	x		x						x			
20	General				x				x								x	x	x		x			x	x	x	x			
21	Mining																x	x	x								x			
22	Ferrous																x	x	x								x			
23	Non-Ferrous				x	x	x	x		x							x	x	x			x	x	x	x	x	x			
24	Oil Refinery						x		x		x						x	x			x									
25	Paint/Pigment					x	x												x						x	x	x			
26	Phosphate				x	x													x			x			x	x	x			
27	Pulp/Paper	x	x	x		x	x		x		x	x	x	x	x	x	x	x	x											
28	Sewage	x	x	x		x				x	x	x	x				x							x						
29	Silico														x							x								
30	Steel Mill								x								x				x						x			
31	Tannery/Textile								x		x																			
32	Water																													
33	Cost, \$/lb				1.48	2.00	2.08		1.65	1.85	0.40	0.95	0.10	1.24	1.45		1.65	1.65	1.65		1.80	1.24	1.24	1.24	1.24	1.24	1.24			

		DOW CHEMICAL OF CANADA LTD. (Cont.)												
		(1) Tydex XD												
		87D	12	1183	1629.	8256.02	8256.03	8315.01	8317.01	8318				
1	Charge	A	C	A	N	C	C	N	N	A				
2	Activity	lo			-			-	-	vh				
3	Type	PAM	PEI	PAC	PAM			PAM	PAM	PAM				
4	Mol Weight	M	M	VH	H			H	H	H				
5	Form	LI	LI	P	P	P	P	P	P	P				
6	pH	7.0	9.6											
7	Sp Gravity	1.07	1.07											
8	Shelf Life	6+	12											
9	pH Range	4-5	5-8	6-14	0-14			4-12	1-14	6-14				
10	Clarification				x				x					
11	Thickening								x	x				
12	Dewatering	x	x						x	x				
13	C.C.D.								x					
14	Brines								x					
15	Chem Plant								x					
16	Clay								x					
17	Coal								x	x				
18	Food													
19	Ind Minerals									x				
20	General								x	x				
21	Ferrous				x				x	x				
22	Non-Ferrous								x					
23	Oil Refinery													
24	Paint/Pigment													
25	Phosphate								x	x				
26	Pulp/Paper	x	x					x						
27	Sewage		x											
28	Silica													
29	Steel Mill													
30	Tannery/Textile													
31	General		x		x				x	x				
32	Potable	-	-		-				-	-				
33	~ Cost, \$/lb													

(1) Dow Strength Resin

		GENERAL MILLS CHEMICALS, INC.												
		Guartec												
		1018	FXM											
1	Charge	N	N											
2	Activity	-	-											
3	Type	GG	GG											
4	Mol Weight	M	M											
5	Form	P	P											
6	pH	6.9	6.8											
7	Sp Gravity	0.82	0.82											
8	Shelf Life		6											
9	pH Range	1-12	1-12											
10	Clarification	x	x											
11	Thickening	x	x											
12	Dewatering													
13	C.C.D.													
14	Brines		x											
15	Chem Plant	x	x											
16	Clay		x											
17	Coal		x											
18	Food													
19	Ind Minerals													
20	General	x												
21	Ferrous													
22	Non-Ferrous	x	x											
23	Oil Refinery	x	x											
24	Paint/Pigment													
25	Phosphate													
26	Pulp/Paper		x											
27	Sewage													
28	Silica													
29	Steel Mill													
30	Tannery/Textile													
31	General								x	x				
32	Potable	x	x											
33	~ Cost, \$/lb	0.42	0.35											

		B.F. GOODRICH CHEMICAL CANADA											
		Good-Rite											
		K-702	K-705	K-708	K-714	K-716	K-718						
1	CHARACTERISTICS	Charge	A	A	A	A	A	A					
2		Activity											
3		Type	FAA	FAc	FAc	FAA	FAc	FAc					
4		Mol Weight	M	M	M	M	M	M					
5		Form	LI	LI	LI	LI	LI	LI					
6		pH	2.0	8.0	8.4	2.0	8.0	8.0					
7		Sp Gravity	1.09	1.10	1.14	1.05	1.04	1.03					
8		Shelf Life			6			6					
9	PROCESS	pH Range	4-12	4-12	4-12	5-11	4-12	4-12					
10		Clarification											
11		Thickening											
12		Dewatering											
13	C.C.D.												
14	FIELDS OF APPLICATION	Brines											
15		Chem Plant	x			x							
16		Clay											
17		Coal											
18		Food											
19		Ind Minerals											
20		Mining	General	x			x						
21			Ferrous										
22			Non-Ferrous										
23		Oil Refinery											
24		Paint/Pigment											
25		Phosphate											
26		Pulp/Paper	x			x							
27	Sewage												
28	Silica												
29	Steel Mill												
30	Tannery/Textile												
31	Water	General	x	x	x	x	x	x					
32		Potable											
33	Cost, \$/lb	1.20	1.10	1.10	1.20	1.10	1.10						

		GAF CORPORATION											
		Gantrez AN											
		149	169	FVP									
1	CHARACTERISTICS	Charge	A	A	N								
2		Activity			-								
3		Type	MVE	MVE	FVP								
4		Mol Weight	M	H	M								
5		Form	P	P	P/LI								
6		pH	2.4	2.4									
7		Sp Gravity	0.32	0.32									
8		Shelf Life	Ind.	Ind.									
9	PROCESS	pH Range	7-14	7-14	1-10								
10		Clarification	x	x	x								
11		Thickening											
12		Dewatering	x	x									
13	C.C.D.												
14	FIELDS OF APPLICATION	Brines											
15		Chem Plant	x	x									
16		Clay	x	x									
17		Coal											
18		Food	x	x	x								
19		Ind Minerals	x	x									
20		Mining	General	x	x								
21			Ferrous										
22			Non-Ferrous	x	x								
23		Oil Refinery	x	x									
24		Paint/Pigment											
25		Phosphate	x	x									
26		Pulp/Paper	x	x									
27	Sewage												
28	Silica												
29	Steel Mill	x	x										
30	Tannery/Textile												
31	Water	General	x	x									
32		Potable	-	-									
33	Cost, \$/lb	1.55	1.58	1.25									

		HERCULES CANADA LTD.												
		Hercofloc					SPX							
		813.3	817.2	819.2	824.3	829.3	832.1	833.2	1038	5022	5024			
1 2 3 4 5 6 7 8	CHARACTERISTICS	Charge	C	A	A	H	C	C	A	C	A	A		
	Activity	lo	lo	h	-	m	vh	m	h	m	lo			
	Type	PAM	PAM	PAM	PAM	PAM	PA	PAM	PAM	PAM	PAM			
	Mol Weight	H	H	H	H	H	H	H	H	H	H			
	Form	P	P	P	P	P	LI	P	P	P	P			
	pH	6.2	8.1	8.7	7.7	5.8	5.0	8.4	6.1	8.2				
	Sp Gravity	0.70	0.70	0.70	0.70	0.70		0.70		0.70				
	Shelf Life	12	12	12	12	12	12	12		12				
9 10 11 12 13	PROCESS	pH Range	3-8	5-11	5-11	0-14	3-8	2-8	5-11		1-9			
	Clarification	x	x	x	x	x		x	x	x	x			
	Thickening	x	x	x	x	x		x	x	x	x			
	Dewatering	x	x	x	x	x		x	x	x				
	C.C.D.	-	-	-	-	-	-	-	-	-	-			
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	FIELDS OF APPLICATION	Brines												
	Chem Plant													
	Clay													
	Coal	x	x	x	x			x		x	x			
	Food													
	Ind Minerals													
	General													
	Mining													
	Ferrous			x						x	x			
	Non-Ferrous		x		x				x	x	x			
	Oil Refinery													
	Paint/Pigment													
Phosphate				x	x					x	x			
Pulp/Paper														
Sewage														
Silica														
Steel Mill														
Tannery/Textile														
Water														
General	x	x	x	x	x									
Potable	-	-	-	-	-									
33	Cost, \$/lb	1.84	1.28	1.28	1.28	2.16	0.38	1.28	1.30	1.30	1.30			

		HODAG INTERNATIONAL S.A., INC.												
		Flocs												
		111	115											
1 2 3 4 5 6 7 8	CHARACTERISTICS	Charge	A	A										
	Activity													
	Type	PAM	PAM											
	Mol Weight	H	H											
	Form	P	P											
	pH	10.5	10.5											
	Sp Gravity													
	Shelf Life	Ind.	Ind.											
9 10 11 12 13	PROCESS	pH Range	2-12	2-12										
	Clarification	x	x											
	Thickening													
	Dewatering	x	x											
	C.C.D.													
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	FIELDS OF APPLICATION	Brines												
	Chem Plant	x	x											
	Clay													
	Coal													
	Food	x	x											
	Ind Minerals	x	x											
	General	x	x											
	Mining													
	Ferrous													
	Non-Ferrous													
	Oil Refinery													
	Paint/Pigment													
Phosphate														
Pulp/Paper	x	x												
Sewage	x	x												
Silica														
Steel Mill														
Tannery/Textile														
Water														
General		x												
Potable	x	-												
33	Cost, \$/lb	1.42	1.42											

		ROECHST CHEMICALS																	
		Boxefloc																	
		N25	N26F	A31	A41	A42	C45												
1	CHARACTERISTICS	Charge	X	M	A	A	A	C											
2		Activity	-	-	M	h	lo	vh											
3		Type	PAM	PAM	PAM	PAM	PAM												
4		Mol Weight	H	H	H	H	H	H											
5		Form	P	P	P	P	P	P											
6		pH																	
7		Sp Gravity	0.25	0.25	0.35	0.45	0.30	0.55											
8		Shelf Life	24+	24+	36+	36+	36+	24+											
9		pH Range	0-14	0-14	7-14	7-14	7-14	6-8											
10	PROCESS	Clarification	x	x	x	x	x	x											
11		Thickening	x	x	x	x	x	x											
12		Dewatering			x	x													
13		C.C.D.																	
14		Brines	x	x	x	x	x												
15	FIELDS OF APPLICATION	Chem Plant			x	x	x												
16		Clay			x	x	x												
17		Coal	x	x	x	x	x												
18		Food			x	x	x												
19		Ind Minerals	x	x	x	x													
20		Mining	General			x	x	x											
21			Ferrous			x	x	x											
22			Non-Ferrous	x	x	x	x	x											
23		Oil Refinery		x															
24		Paint/Pigment																	
25		Phosphate																	
26		Pulp/Paper																	
27	Sewage						x												
28	Silica																		
29	Steel Mill	x	x	x	x	x													
30	Tannery/Textile																		
31		General	x	x	x	x	x												
32	Water	Potable	-	-	*	*	*	x											
33		Cost, \$/lb																	

		KELCO COMPANY														
		Kelco	Kelgin	Kelzan												
		SGS HV	HV 1277M	-												
1	CHARACTERISTICS	Charge	A	A	A											
2		Activity														
3		Type	NACS	ALG	XAN											
4		Mol Weight														
5		Form	P	P	P											
6		pH	9.0	7.5	7.0											
7		Sp Gravity														
8		Shelf Life	Good	Good	Good											
9		pH Range	8-14	4-11	1-11											
10	PROCESS	Clarification														
11		Thickening		x	x											
12		Dewatering														
13		C.C.D.														
14		Brines														
15	FIELDS OF APPLICATION	Chem Plant	x	x												
16		Clay														
17		Coal														
18		Food	x	x												
19		Ind Minerals		x	x											
20		Mining	General	x	x											
21			Ferrous													
22			Non-Ferrous													
23		Oil Refinery														
24		Paint/Pigment														
25		Phosphate														
26		Pulp/Paper	x	x												
27	Sewage															
28	Silica															
29	Steel Mill															
30	Tannery/Textile															
31		General	x	x												
32	Water	Potable														
33		Cost, \$/lb														

		NATIONAL SILICATES LTD.									
		FQ N-Sol ¹⁾									
		A	B	C	D	E					
1	Charge	A	A	A	A	A					
2	Activity	-	-	-	-	-					
3	Type	IN	IN	IN	IN	IN					
4	Mol Weight										
5	Form	LI	LI	LI	LI	LI					
6	pH										
7	Sp Gravity										
8	Shelf Life	Ind.	Ind.								
9	pH Range	4-9	4-9	4-9	4-9	4-9					
10	Clarification	x	x	x	x	x					
11	Thickening	x	x	x	x	x					
12	Dewatering	x	x	x	x	x					
13	C.C.D.										
14	Brines										
15	Chem Plant										
16	Clay										
17	Coal										
18	Food	x	x	x	x	x					
19	Ind Minerals										
20	General										
21	Ferrous										
22	Non-Ferrous										
23	Oil Refinery	x	x	x	x	x					
24	Paint/Pigment										
25	Phosphate										
26	Pulp/Paper	x	x	x	x	x					
27	Sewage	x	x	x	x	x					
28	Silica										
29	Steel Mill										
30	Tannery/Textile	x	x	x	x	x					
31	Water										
32	General	x	x	x	x	x					
32	Potable	x	x	x	x	x					
33	~ Cost, \$/lb										

1) Activated Silica

		NATIONAL STARCH AND CHEMICAL CO. (CANADA) LTD.									
		Natron									
		88	6082								
1	Charge	C	A/C								
2	Activity										
3	Type	PA									
4	Mol Weight										
5	Form	LI	LI								
6	pH	2.8	2.5								
7	Sp Gravity	1.09	1.05								
8	Shelf Life	6 +	6 +								
9	pH Range	4-8	0-6								
10	Clarification	x	x								
11	Thickening	x	x								
12	Dewatering	x	x								
13	C.C.D.	-	-								
14	Brines										
15	Chem Plant										
16	Clay										
17	Coal										
18	Food	x									
19	Ind Minerals										
20	General	x									
21	Ferrous	x									
22	Non-Ferrous										
23	Oil Refinery	x									
24	Paint/Pigment	x									
25	Phosphate										
26	Pulp/Paper	x	x								
27	Sewage	x									
28	Silica										
29	Steel Mill	x									
30	Tannery/Textile	x									
31	Water										
32	General	x	x								
32	Potable	-	-								
33	~ Cost, \$/lb	0.26	0.17								

		PENNWALT OF CANADA LTD.									
		Ferric Chloride									
		4110	4120								
1	CHARACTERISTICS	Charge	C	C							
2		Activity	-	-							
3		Type	IN	IN							
4		Mol Weight	162	162							
5		Form	P	LI							
6		pH									
7		Sp Gravity	2.80	1.45							
8		Shelf Life	Ind.	Ind.							
9	PROCESS	pH Range	3-11	3-11							
10		Clarification	x	x							
11		Thickening									
12		Dewatering									
13	C.C.D.										
14	FIELDS OF APPLICATION	Brines									
15		Chem Plant									
16		Clay									
17		Coal									
18		Food									
19		Ind Minerals									
20		Mining	General	x	x						
21			Ferrous								
22			Non-Ferrous	x	x						
23		Oil Refinery									
24		Paint/Pigment									
25		Phosphate									
26	Pulp/Paper										
27	Sewage	x	x								
28	Silica										
29	Steel Mill	x	x								
30	Tannery/Textile										
31		Water	x	x							
32	Potable										
33	~ Cost, \$/lb	0.17	0.07								

		ROHM & HAAS CANADA LTD.									
		Primaflor									
		A10	C3	C5	C7						
1	CHARACTERISTICS	Charge	A	C	C	C					
2		Activity	vh			h					
3		Type	PAA	PA	PA	PA					
4		Mol Weight		M		H					
5		Form	LI	LI	LI	P					
6		pH	3.0		6.5	2.5					
7		Sp Gravity	1.05	1.18	1.12	0.56					
8		Shelf Life									
9	PROCESS	pH Range	5-11	1-14	1-14	2-10					
10		Clarification		x	x	x					
11		Thickening		x		x					
12		Dewatering				x					
13	C.C.D.										
14	FIELDS OF APPLICATION	Brines									
15		Chem Plant		x	x	x					
16		Clay									
17		Coal				x					
18		Food		x		x					
19		Ind Minerals				x					
20		Mining	General			x					
21			Ferrous								
22			Non-Ferrous								
23		Oil Refinery									
24		Paint/Pigment									
25		Phosphate									
26	Pulp/Paper		x	x	x						
27	Sewage		x	x	x						
28	Silica										
29	Steel Mill										
30	Tannery/Textile				x						
31		Water	x	x	x	x					
32	Potable	-	-	-	-						
33	~ Cost, \$/lb	0.36	0.50	0.61	1.42						

		SANDOZ COLOURS AND CHEMICALS									
		Cartaretin					Sandofix				
		F					SWE				
1	Charge	C					C				
2	Activity										
3	Type	PA									
4	Mol Weight										
5	Form	LI					LI				
6	pH	8.1					7.2				
7	Sp Gravity	1.06									
8	Shelf Life	6 +					Ind.				
9	pH Range	3-9					3-9				
10	Clarification	x									
11	Thickening										
12	Dewatering	x					x				
13	C.C.D.										
14	Brines										
15	Chem Plant	x					x				
16	Clay	x					x				
17	Coal	x									
18	Food										
19	Ind Minerals										
20	Mining	General									
21		Ferrous									
22		Non-Ferrous									
23	Oil Refinery										
24	Paint/Pigment										
25	Phosphate										
26	Pulp/Paper										
27	Sewage										
28	Silica										
29	Steel Mill										
30	Tannery/Textile	General									
31		Potable									
32	Water	-									
33	~ Cost, \$/lb	0.30					0.52				

		A.E. STALEY MFG. CO.									
		Hamaco					Pearl Starch				
		267									
1	Charge	N					N				
2	Activity	-									
3	Type	PS ¹⁾					PS ²⁾				
4	Mol Weight										
5	Form	P					P				
6	pH										
7	Sp Gravity										
8	Shelf Life										
9	pH Range										
10	Clarification	x					x				
11	Thickening										
12	Dewatering										
13	C.C.D.										
14	Brines										
15	Chem Plant										
16	Clay										
17	Coal										
18	Food										
19	Ind Minerals										
20	Mining	General					x				
21		Ferrous									
22		Non-Ferrous									
23	Oil Refinery										
24	Paint/Pigment										
25	Phosphate										
26	Pulp/Paper										
27	Sewage										
28	Silica										
29	Steel Mill										
30	Tannery/Textile	General									
31		Potable									
32	Water	x					x				
33	~ Cost, \$/lb										

1) Potato Starch: 2) Corn Starch

		STEIN-HALL, LTD.																										
		Jaguar							MRL		Polyhall							Vinrez										
		MD-7A	MDD	MRL 22A	42-A	333	387	444	730	201	332	40	44C	59	295	296	297	320	402	430	540	630	650	TP41- 7				
1	CHARACTERISTICS	Charge	N	N	C	N	N	N	C	N	A	N	N	A	A	A	A	N	N	A	A	A	N	N				
2		Activity	-	-	-	-	-	-	-	-	-	-	-	-	lo	m	h	-	-	-	m	lo	-	-				
3		Type	GG	GG	GG	GG	GG	GG	GG			PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM					
4		Mol Weight	M	M	M		M								H				H									
5		Form	P	P	P		P							P					P									
6		pH		6.2	5.8		6.7							7.5					5.2									
7		Sp Gravity		0.76	0.76		0.76							0.56					0.44									
8		Shelf Life	Ind.	Ind.	Ind.		Ind.																					
9	PROCESS	pH Range		0-11	0-14		0-11							5-12					0-11									
10		Clarification	x	x	x	x	x	x	x	x	-	-	x	x	-	-	x	x	x	x	x	x	x	-				
11		Thickening	x	x	-	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
12		Dewatering	x	x	-	x	x	x	x	x	-	-	x	x	-	-	x	x	x	x	x	x	x	-				
13		C.C.D.		-	-																							
14	FIELDS OF APPLICATION	Brines																										
15		Chem Plant																	x									
16		Clay													x				x									
17		Cool		x	x		x																					
18		Food																										
19		Ind Minerals		x	x		x																					
20		Mining																										
21		General								x																		
22		Ferrous																										
23		Non-Ferrous		x	x		x												x									
24		Oil Refinery		x	x																							
25		Paint/Pigment																										
26		Phosphate																	x									
27		Pulp/Paper		x	x																							
28		Sewage																										
29		Silica																										
30		Steel Mill																										
31		Tannery/Textile																										
32		Water																										
33		General	x	x	x	x	x	x	x	x	x				x													
34		Potable		x											x													
35		Cost, \$/lb		0.45	0.68		0.50							0.75					0.75									

		TAR RESIDUALS LTD.											
		TR											
		11APR	25AP	90AP	91AP	93AP	95AP	80NP	80NPZ	11CPR	90CP	91CP	CLR
1	CHARGE	A	A	A	A	A	A	N	N	C	C	C	C
2	ACTIVITY	m	h	lo	m	h	vh	-	-	m	lo	m	h
3	TYPE	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PAM	PA
4	MOL WEIGHT	H	H	VH	VH	VH	VH	VH	VH	H	VH	VH	
5	FORM	P	P	P	P	P	P	P	P	P	P	P	LI
6	pH		8.5	6.8	7.2	8.0	8.9	6.7					
7	Sp Gravity	0.65	0.56	0.65	0.88	0.65	0.65	0.68	0.55	0.65	0.58	0.58	1.00
8	Shelf Life	6	6	6	6	6	6	6	6	6	6	6	6
9	PROCESS												
9	pH Range	4-12	4-12	4-12	4-12	4-12	4-12	2-12	2-12	3-8	3-8	3-8	3-8
10	Clarification		x	x	x	x	x	x	x		x	x	
11	Thickening			x	x	x	x	x	x				
12	Dewatering	x	x	x	x	x	x	x	x	x	x	x	x
13	C.C.D.							x					
14	Brines												
15	Chem Plant												
16	Clay			x	x	x	x			x	x		
17	Coal		x	x	x		x	x					
18	Food					x							
19	Ind Minerals			x	x	x	x			x	x		
20	Mining							x					
21	General							x					
22	Ferrous		x					x					
23	Non-Ferrous							x					
24	Oil Refinery												
25	Paint/Pigment												
26	Phosphate		x					x					
27	Pulp/Paper	x		x	x	x	x	x		x	x	x	x
28	Sewage												
29	Silica									x	x		
30	Steel Mill												
31	Tannery/Textile												
32	Water												
31	General		x	x	x	x	x	x		x	x		
32	Potable			*	*	*	*	*		*	*		
33	Cost, \$/lb							1.50	1.50				

		UNION CARBIDE CANADA LTD.											
		Polymer		Polyox									
		X-150	Coag- ulant										
1	CHARGE	C	N										
2	ACTIVITY	h	-										
3	TYPE	PA	PEO										
4	MOL WEIGHT	L	H										
5	FORM	LI	P										
6	pH	4.5											
7	Sp Gravity	1.08	0.38										
8	Shelf Life		12										
9	PROCESS												
9	pH Range	1-12	2-10										
10	Clarification	x	x										
11	Thickening												
12	Dewatering	x	x										
13	C.C.D.												
14	Brines												
15	Chem Plant		x										
16	Clay		x										
17	Coal		x										
18	Food												
19	Ind Minerals												
20	Mining												
20	General	x	x										
21	Ferrous												
22	Non-Ferrous		x										
23	Oil Refinery												
24	Paint/Pigment												
25	Phosphate		x										
26	Pulp/Paper	x	x										
27	Sewage		x										
28	Silica		x										
29	Steel Mill												
30	Tannery/Textile												
31	Water												
31	General	x	x										
32	Potable	-	-										
33	Cost, \$/lb		1.25										

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