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MINING, METALLURGICAL & CHEMICAL BRANCH

THE ACIDS, ALKALIES AND SALTS INDUSTRY IN CANADA 1940

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ANNUAL INDUSTRY REPORT — CHEMICALS AND ALLIED PRODUCTS GROUP

THE ACIDS, ALKALIES AND SALTS INDUSTRY - 1940

Twenty-seven plants in Canada made heavy chemicals as their chief products in 1940 and were classified to the Acids, Alkalies and Salts Industry. Production by this group was valued at $31,000,928, or 34.4 per cent higher than in the previous year. The investment in these plants totalled $45,832,949 and the number of employees was 4,002.

The following chemicals were made by the factories in this group: sulphuric acid, hydrochloric acid, nitric acid, glacial acetic acid, phosphoric acid, stearic acid, fatty acids of palm oil, cocoanut oil and tallow; calcium carbide, calcium cyananide, calcium chloride, soda ash, nitre cake, salt cake, caustic soda, Glauber's salt, sodium cyanide, sodium silicate, sodium chlorate, sodium hypochlorite, hexachlorethane, disodium and trisodium phosphate, anhydrous tetrasodium pyrophosphate, liquid chlorine, satin white, phosphorus, acid calcium phosphate, potassium chlorate, synthetic ammonia, sulphur dichloride, sulphur monochloride, aluminium fluoride, metallic naphthenates, ferric chloride, hydrogen peroxide, butyl acetate, ethyl acetate, paraldehyde, croton aldehyde, acetone, acetic anhydride, vinyl acetate resins, acetylene carbon black, zinc chloride, zinc oxide, liquid sulphur dioxide, perchlorethylene, trichlorethylene, ammonium chloride, plating and galvanizing salts, weed killer and elemental sulphur. Separate production figures are published for sulphuric acid only, as each of the other items are made by less than three firms.

The output of sulphuric acid increased to 312,699 tons (66° Bé) in 1940 from 249,558 tons in 1939. Seven plants were operated by four companies, as follows: The Consolidated Mining and Smelting Company of Canada, Limited, at Trail, B.C.; Canadian Industries Limited at Copper Cliff, Ont., Hamilton, Ont., and New Westminster, B.C.; Nichols Chemical Company Limited at Sulphide, Ont., and Barnet, B.C.; and the Dominion Steel and Coal Corporation Limited at Sydney, N.S. The first two of these works, at Trail and at Copper Cliff, operated entirely on sulphur-bearing smelter gases. Only 142 tons of sulphuric acid were imported during 1940 and 2,244 tons were exported.

Imports of acids of all kinds were valued at $2.6 millions in 1940. Stearic acid, citric acid, tartaric acid, boracic acid, salicylic and acetyl salicylic acid, and xanthates and sulpho-thio-phosphoric compounds for use in concentrating ores were among the more important items. Exports of acids were appraised at $2.7 millions.

Imports of other chemicals totalled $24.4 millions in 1940, including the following among the more important items:- compounds of tetraethyl lead, sodium nitrate, sulphate of potash, muriate of potash, sodium cyanide, alum cake, ammonium nitrate, sodium bicarbonate, sodium bichromate, caustic soda, and borax. Exports of chemicals amounted to $17.3 millions, mostly cyanamide, ammonium sulphate, and sodium compounds.

Publication of detailed figures of imports and exports has been suspended for the duration of the war.

Table 1 - PRINCIPAL STATISTICS OF THE ACIDS, ALKALIES AND SALTS INDUSTRY, 1930 - 1940

Years	No. of plants	Capital employed	Average number of employees	Salaries and wages	Cost of fuel and electricity at works	Cost of materials at works	Gross selling value of products at works
		$		$	$	$	$
1930	17	52,314,567	2,409	3,502,834	2,490,790	4,712,471	20,111,602
1931	14	44,994,828	1,694	2,426,880	2,167,585	2,407,682	10,952,497
1932	14	44,067,194	1,679	2,211,467	2,103,675	2,283,076	11,357,649
1933	15	44,239,418	1,891	2,315,425	1,407,378	2,463,958	12,713,045
1934	16	45,033,355	2,289	2,841,853	1,872,137	3,674,265	16,494,139
1935	18	33,381,688	2,627	3,490,897	2,158,692	4,606,713	19,012,615
1936	20	32,596,308	2,966	3,988,310	2,316,389	4,680,299	18,959,512
1937	21	35,094,008	3,863	4,896,618	2,810,364	6,008,977	22,410,168
1938	24	32,254,723	2,991	4,571,579	2,349,819	5,223,443	20,476,578
1939	25	36,978,482	3,128	5,032,898	2,548,217	6,021,716	23,056,606
1940							
Quebec	8	15,397,153	1,589	2,476,894	1,408,318	3,589,370	8,712,868
Ontario	15	29,669,812	2,157	3,710,470	2,344,685	4,824,830	19,808,391
British Columbia ...	3)	765,984	256	440,331	41,626	404,051	2,479,669
Nova Scotia.	1)						
CANADA ...	27	45,832,949	4,002	6,627,695	3,794,629	8,818,251	31,000,928
Per cent change 1940 from 1939	-	+ 34.4	+ 27.8	+ 31.6	+ 48.9	+ 46.4	+ 34.4

NOTE - Profits or losses cannot be calculated from above figures as data are not available for general expense items, such as, interest, rent, depreciation, taxes, insurance, advertising, etc.

Table 2 - CAPITAL EMPLOYED, 1931 - 1940

Years	Present value of lands, buildings, machinery, tools and other equipment	Inventory value of materials on hand, stocks in process, finished products, fuel and other supplies	Operating capital (cash, bills and accounts receivable, etc.)	TOTAL CAPITAL EMPLOYED
	$	$	$	$
1931	31,608,809	3,385,719	10,000,300	44,994,828
1932	30,746,174	3,803,349	9,517,671	44,067,194
1933	29,840,246	3,470,243	10,928,929	44,239,418
1934	29,775,661	4,206,998	11,050,696	45,033,355
1935	25,907,178	4,172,459	3,302,051	33,381,688
1936	24,971,587	4,174,038	3,450,683	32,596,308
1937	25,845,956	5,200,279	4,047,773	35,094,008
1938	22,512,947	5,021,973	4,719,803	32,254,723
1939	24,009,603	4,710,704	8,258,175	36,978,482
1940				
Quebec	8,170,598	4,002,824	3,223,731	15,397,153
Ontario	16,513,541	5,446,389	7,709,882	29,669,812
Other provinces	748,921	15,145	1,918	765,984
CANADA	25,433,060	9,464,358	10,935,531	45,832,949

Table 3.- EMPLOYEES, SALARIES AND WAGES, 1931 - 1940

Years	Average number of employees					Salaries	Wages	TOTAL SALARIES and WAGES
	On salaries		On wages					
	Male	Female	Male	Female	TOTAL			
						$	$	$
1931	341	26	1,324	3	1,694	771,271	1,655,609	2,426,880
1932	312	33	1,329	5	1,679	746,726	1,464,741	2,211,467
1933	327	39	1,521	4	1,891	780,267	1,535,158	2,315,425
1934	403	49	1,832	5	2,289	845,253	1,996,600	2,841,853
1935	584	110	1,925	8	2,627	1,227,893	2,263,004	3,490,897
1936	603	112	2,242	9	2,966	1,297,038	2,691,272	3,988,310
1937	603	114	2,634	8	3,359	1,467,125	3,426,293	4,893,418
1938	576	100	2,305	10	2,991	1,583,938	2,987,641	4,571,579
1939	601	121	2,393	13	3,128	1,707,677	3,325,221	5,032,898
1940 -								
Quebec	174	35	1,372	8	1,589	642,009	1,834,885	2,476,894
Ontario	404	99	1,646	8	2,157	1,177,349	2,533,121	3,710,470
Other provinces .	23	2	231	-	256	59,604	380,727	440,331
CANADA	601	136	3,249	16	4,002	1,878,962	4,748,733	6,627,695

Table 4 - WAGE-EARNERS, BY MONTHS, 1939 and 1940 (On the last work day of each month)

	1939			1940		
	Male	Female	TOTAL	Male	Female	TOTAL
January	2,207	9	2,216	2,846	13	2,859
February	2,230	9	2,239	2,870	12	2,882
March	2,217	9	2,226	2,868	14	2,882
April	2,238	9	2,247	2,981	14	2,995
May	2,286	10	2,296	3,212	14	3,226
June	2,273	12	2,285	3,305	16	3,321
July	2,295	12	2,307	3,321	19	3,340
August	2,369	12	2,381	3,532	20	3,552
September	2,601	13	2,614	3,638	20	3,658
October	2,688	12	2,700	3,508	22	3,530
November	2,686	12	2,698	3,511	21	3,532
December	2,617	13	2,630	3,485	18	3,503
AVERAGE	2,393	13	2,406	3,249	16	3,265

Table 5 - HOURS WORKED PER WEEK, 1940 (In one week in month of highest employment; overtime included)

Hours worked per week	Number of wage-earners	Per cent of total	Hours worked per week	Number of wage-earners	Per cent of total
30 hours or less ...	44	1.2	49 - 50 hours ..	92	2.4
31 - 43 hours	343	9.1	51 - 54 hours ..	104	2.7
44 hours	303	8.1	55 hours	6	.2
45 - 47 hours	148	3.9	56 - 64 hours ..	286	7.6
48 hours	2,445	64.4	65 hours and over	14	.4
			Total	3,785	100.0
			Total wages paid in selected week ..	$101,229	

Table 6 - FUEL AND ELECTRICITY USED, 1939 and 1940

Kinds	Unit of measure	1939 Quantity	1939 Cost at works	1940 Quantity	1940 Cost at works
			$		$
Bituminous coal - Canadian	short ton	25,070	99,361	37,836	172,270
Foreign	short ton	132,509	597,241	154,125	767,061
Anthracite coal	short ton	3,326	3,044	486	4,655
Coke	short ton	198	1,665	60	560
Gasoline	Imp. gal.	62,019	10,491	62,004	10,198
Fuel oil	Imp. gal.	716,508	35,472	816,459	45,832
Gas - Manufactured	M cu. ft.	82	61	737	617
Natural	M cu. ft.	840	450	842	451
Other fuel	xxx	...	37,003	-	83,409
Electricity purchased	K. W. H.	906,175,541	1,763,429	1,283,401,705	2,709,576
TOTAL	xxx	...	2,548,217	-	3,794,829
Electricity generated for own use	K. W. H.	93,938,368	...	107,023,958	-

Table 7 - POWER EQUIPMENT, 1939 and 1940

Kinds	Ordinarily in use: Number of units	Ordinarily in use: Total rated horse power	In reserve or idle: Number of units	In reserve or idle: Total rated horse power
1939				
Steam engines and steam turbines..	25	9,166	6	653
Gasoline, gas and oil engines	...	...	1	150
Hydraulic turbines or water wheels	5	10,520	...	...
Total primary equipment	30	19,686	7	803
Electric motors operated by purchased power	2,525	55,009	136	5,875
TOTAL	2,555	74,695	143	6,678
Electric motors operated by above primary units	767	9,024	82	1,764
Stationary boilers	22	8,046	10	2,891
1940				
Steam engines and steam turbines..	29	9,260	8	712
Gasoline, gas and oil engines ...	-	-	1	150
Hydraulic turbines or water wheels	5	10,520	-	-
Total primary equipment	34	19,780	9	862
Electric motors operated by purchased power	2,819	58,160	140	5,532
TOTAL	2,853	77,940	149	6,394
Electric motors operated by above primary units	934	10,065	58	1,245
Stationary boilers	26	8,796	9	2,550

Table 8 - PRODUCTION, IMPORTS, EXPORTS and APPARENT CONSUMPTION OF SULPHURIC ACID (66° Bé) 1924 - 1940

Years	Production	Imports	Exports	Apparent consumption
		(short tons)		
1924	71,991	47	7,678	64,360
1925	83,396	52	19,179	64,269
1926	108,230	53	28,137	80,146
1927	98,470	53	17,407	81,116
1928	96,227	55	13,329	82,953
1929	110,749	111	8,397	102,463
1930	107,352	150	571	106,931
1931	119,541	80	997	118,624
1932	136,846	62	712	136,196
1933	148,142	58	1,013	147,187
1934	205,325	82	953	204,454
1935	224,410	83	1,027	223,466
1936	241,075	108	1,128	240,055
1937	282,716	108	1,608	281,216
1938	268,339	95	1,260	267,174
1939	249,558	119	1,605	248,072
1940	312,699	142	2,244	310,597

LIST OF FIRMS INCLUDED IN THE ACIDS, ALKALIES AND SALTS INDUSTRY, 1940

Names of Companies and Location of Plants	Products reported in 1940
Dominion Steel & Coal Corporation Limited, Sydney, N.S.	Sulphuric acid
Aluminum Company of Canada Ltd., Arvida, P.Q.	Aluminium fluoride
Canadian Industries Limited, Shawinigan Falls, P.Q. (3 plants)	Liquid hydrogen peroxide, liquid chlorine, chlorine gas, sodium hydroxide, trichlorethylene and perchlorethylene.
Defence Industries Limited, Shawinigan Falls, P.Q.	Hexachlorethane.
Electric Reduction Company of Canada, Limited, Buckingham, P.Q.	Phosphorus, phosphoric acid, ferro-phosphorus, sodium chlorate, acid calcium phosphate, disodium phos-phate (2 hydrate and 12 hydrate), trisodium phosphate, sodium acid pyrophosphate, potassium chlorate, calcium phosphide, acid sodium orthophosphate, neutral sodium pyrophosphate (anhydrous) chlorate weed killing mixture.
Shawinigan Chemicals Limited, Shawinigan Falls, P.Q.	Acetic anhydride, acetone, acetylene black, glacial acetic acid, acety-lene gas, butyl acetate, calcium carbide, dibutyl phthalate, ethyl acetate, hydrated lime, paraldehyde, pentasol acetate, vinyl acetate, vinyl acetate resins, cerium, frothing agent.
Zinc Oxide Co. of Canada, Ltd., 6984 Notre Dame St. E., Montreal, P.Q.	Zinc oxide.
Brunner, Mond Canada, Limited, Amherstburg, Ont.	Sodium carbonate (soda ash), calcium chloride, tanners' alkali (sodium carbonate and sodium hydroxide), super-alkali (sodium carbonate and sodium hydroxide).
Canadian Hanson & Van Winkle Co. Ltd., 15 Morrow Avenue, Toronto, Ont.	Plating and galvanizing salts (copper cyanide, copper carbonate, zinc cyanide, nickel salts)
Canadian Industries Limited, Copper Cliff, Ont.	Sulphuric acid

LIST OF FIRMS INCLUDED IN THE ACIDS, ALKALIES AND SALTS INDUSTRY, 1940
(Concluded)

Names of Companies and Location of Plants	Products reported in 1940
Canadian Industries Limited, Cornwall, Ont.	Hydrochloric acid, liquid chlorine, sodium hydroxide (caustic soda).
Canadian Industries Limited, Burlington St., Hamilton, Ont.	Hydrochloric acid, sulphuric acid, sodium sulphite, sodium sulphate (Glauber's salt), sodium sulphate (salt cake), soldering flux and ammonium chloride, zinc chloride solution, liquid sulphur dioxide.
Canadian Industries Limited, Windsor, Ont.	Liquid chlorine, sodium hydroxide (caustic soda), sodium hypochlorite, anhydrous ammonia, aqua ammonia, 26°, sulphur dichloride, sulphur monochloride, ferric chloride, lye-vat alkali, chloride of lime.
Electro Metallurgical Co. of Canada, Ltd., Welland, Ont.	Calcium carbide.
Fine Chemicals Ltd., 587 Fleet St. West, Toronto, Ont.	Glandular products.
Hardesty of Canada Ltd., W.C. 521 Front St. E., Toronto	Hydrogenated stearic acid, crude glycerine, fatty acids of palm oil, coconut oil and tallow.
Nuodex Products of Canada Ltd. 34 Industrial St., Leaside	Metallic naphthenates
H. S. & T. Crystal Co. Ltd., New Toronto, Ont.	Satin white, solvents
National Silicates Limited, New Toronto, Ont.	Sodium silicate
The Nichols Chemical Company Limited, Sulphide, Ont.	Nitric acid, sulphuric acid, sodium bisulphate (nitre cake)
North American Cyanamid Limited, Niagara Falls, Ont.	Calcium cyanamide, cyanide, and sodium silicate
Watts Chemical Co., 355 Weston Rd., Toronto, Ont.	Zinc oxide and zinc dust
Canadian Industries Limited, New Westminster, B.C.	Sulphuric acid and hydrochloric acid
Consolidated Mining & Smelting Company of Canada, Limited, Trail, B.C.	Sulphuric acid, sulphur (brimstone) hydrofluosilicic acid, anhydrous ammonia.
The Nichols Chemical Company Limited, Barnet, B.C.	Sulphuric acid

TOTAL PRODUCTION OF CHEMICALS IN CANADA

It is very difficult, if not impossible, to get from official reports the statistics covering the total production in Canada of heavy and fine chemicals. There are two reasons for this, the first being that data for many of the individual items cannot be shown because they were made by only one or two concerns, and the second being that chemicals are made in a great number of different industries. Ethyl alcohol, for example, is a product of the distilled liquors industry, methyl alcohol comes under wood distillation, fine chemicals are made in the pharmaceutical industry, ammonium sulphate is produced in coke plants, cobalt and nickel salts are made in the non-ferrous metal smelters and refineries, and so on. The Bureau has made, therefore, a special compilation which gives a fairly good summary of the total output as gathered up from all industries, this being shown below. The values cover only the products made for sale as there is no adequate record of the intermediates made for the further use of the producers. The output in 1940 was around $48,600,000 compared with $39,800,000 in 1939. Imports in 1940, on a similar basis, amounted to $27,000,000 and exports totalled $20,000,000. Canadian factories thus accounted for about 50 per cent of the chemical requirements of this country, besides contributing to exports.

Table 12 - TOTAL PRODUCTION OF INDUSTRIAL CHEMICALS IN CANADA, 1939 and 1940.

Commodity	Selling value at works 1939	1940
	$	$
Acids, including acetic, muriatic, nitric, sulphuric, phosphoric, and stearic	2,400,000	3,740,000
Calcium Compounds, including carbide, chloride, cyanamide, cyanide, acid phosphate, grey acetate, arsenate and chloride of lime	9,900,000	12,600,000
Sodium Compounds, including hydroxide, phosphate, silicate, hypochlorite, bisulphite, salt cake, Glauber's salt, chlorate, acid pyro-phosphate, soda ash, sal soda, bisulphate, etc. (pharmaceutical salts included elsewhere)	4,500,000	5,590,000
Organic Chemicals, including acetic anhydride, butyl acetate, iso-butyl acetate, croton aldehyde, ethyl acetate, paraldehyde, pentasol acetate, vinyl acetate, ethyl alcohol, methyl hydrate, glycerine, phenol, cresol, benzol, etc. (acetic acid and acetylene included elsewhere)	6,800,000	7,200,000
Fine Chemicals and Precious Metal Salts, including salts of bismuth, mercury, potassium, sodium, ammonium, magnesium, silver, gold, uranium and radium	1,700,000	1,400,000
Compressed and Liquefied Gases, etc., including acetylene, carbon dioxide, oxygen, nitrous oxide, liquid sulphur dioxide, liquid chlorine, anhydrous and aqua ammonia, etc.	5,300,000	7,100,000
Ammonium Sulphate and Phosphate, and Superphosphate	5,200,000	5,900,000
Other Chemicals, including white lead, zinc oxide, red lead, litharge, cobalt salts, nickel salts, ferric chloride, lead arsenate, zinc stearate, phosphorus, white arsenic, sulphur, hexachlorethane, etc.	4,000,000	5,100,000
TOTAL	39,800,000	48,600,000