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ANNUAL INDUSTRY REPORT

CHEMICALS AND ALLIED PRODUCTS GROUP

THE ACIDS, ALKALIES AND SALTS INDUSTRY, 1942

Thirty-five plants in Canada, classified under the Acids, Alkalies and Salts Industry, were engaged chiefly in the production of heavy chemicals in 1942. Production reported by this group was valued at \$65,123,577, an increase of 29.9 per cent over the total for the previous year. The investment in plants, equipment and supplies totalled \$75,169,327 and the number of employees was 7,842.

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, calcium carbide, calcium cyanamide, calcium chloride, calcium phosphide, soda ash, nitre cake, salt cake, caustic soda, Glauber's salt, sal soda, calcium cyanide, sodium silicate, sodium chlorate, sodium sulphite, sodium hypochlorite, sodium thiosulphite, hexachlorethane, disodium and trisodium phosphate, sodium acid pyrophosphate, tetrasodium pyrophosphate, liquid chlorine, satin white, phosphorus, acid calcium phosphate, potassium chlorate, potassium perchlorate, barium chlorate, synthetic ammonia, sulphur dichloride, sulphur monochloride, aluminium fluoride, metallic naphthenates, ferric chloride, hydrogen peroxide, butyl acetate, ethyl acetate, vinyl acetate, pentasol acetate, acetone, acetic anhydride, vinyl acetate resins, acetylene carbon black, zinc chloride, zinc oxide, nickel formate, liquid sulphur dioxide, perchlorethylene, trichlorethylene, aniline oil, carbon bisulphide, chloride of lime, diphenylamine, monoethylaniline, ammonium chloride, ammonium perchlorate, ammonium nitrate, plating and galvanizing salts, weed killer and elemental sulphur. Separate production figures are published for sulphuric acid only, as each of the other items was made by less than three firms.

The output of sulphuric acid increased to 578,474 tons (66° Be) in 1942 from 468,712 tons in 1941. Ten plants were operated by six 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., New Westminster, B.C.; Nichols Chemical Company Limited at Sulphide, Ont., Valleyfield, Que., and Barnet, B.C.; Dominion Steel and Coal Corporation Limited, at Sydney, N.S.; Welland Chemical Works Ltd., at Niagara Falls, Ont.; and the Aluminum Company of Canada Ltd., at Arvida, Que. The first two of these works, at Trail and at Copper Cliff, operated entirely on sulphur-bearing smelter gases.

Table 1 - PRINCIPAL STATISTICS OF THE ACIDS, ALKALIES AND SALTS INDUSTRY, 1932-1942

Year	No. of plants	Capital employed	Average	Salaries and wages	Cost of	Cost of materials at works	Gross sell-
			number of employees		fuel and electricity at works		ing value of products at works
		\$		\$	\$	\$	\$
1931	14	44,994,328	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	3,983,310	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	27	45,832,949	4,002	6,627,695	3,794,629	8,818,251	31,000,928
1941	32	61,329,966	6,482	11,169,284	5,701,507	17,108,347	50,109,348
1942							
Nova Scotia	1)						
Quebec	10)	23,146,818	2,620	4,305,415	2,757,238	11,838,595	21,235,243
Ontario	19	31,697,116	4,416	8,177,222	4,208,398	11,079,082	36,146,175
Alberta	1)						
British Columbia	)	20,325,393	806	1,645,573	649,723	1,010,292	7,742,159
CANADA	4)	75,169,327	7,942	14,128,610	7,615,359	23,927,969	65,123,577

Per cent

change 1942

from 1941

+22.6

+21.0

+26.5

+33.5

+39.9

+31.9

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, 1932-1942 (On the last day of the year)

Year	Present value of land, buildings, machinery, tools and other equipment	Value of Inventories		Operating capital (cash, bills and accounts receivable, etc.)	TOTAL CAPITAL EMPLOYED
		Raw materials, fuel and other supplies on hand and in process	Finished products and stocks on hand		
	\$	\$	\$	\$	\$
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	25,433,060		9,464,358	10,935,531	45,832,940
1941	36,813,047	6,260,763	2,092,788	16,158,368	61,329,966
1942					
Quebec	11,964,728	3,368,007	1,498,156	6,315,927	23,146,818
Ontario	18,229,493	3,789,528	2,092,881	7,585,214	31,697,116
Other provinces	17,913,693	1,190,195	167,670	1,053,835	20,325,393
CANADA	48,107,914	8,347,730	3,758,707	14,954,976	75,169,327

Table 3 - EMPLOYEES, SALARIES AND WAGES, 1932-1942

Year	Average Number of Employees					Salaries	Wages	TOTAL SALARIES and WAGES
	On Salaries		On Wages		TOTAL			
	Male	Female	Male	Female				
						\$	\$	\$
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	601	136	3,249	16	4,002	1,878,962	4,748,733	6,627,695
1941	1,165	225	5,059	33	6,482	2,821,901	8,347,383	11,169,284
1942 -								
Quebec ...	238	61	2,269	41	2,609	934,691	3,344,399	4,279,090
Ontario ..	894	233	3,157	132	4,416	2,338,684	5,838,538	8,177,222
Other								
provinces	90	22	577	14	703	261,534	1,010,364	1,271,898
CANADA..	1,222	316	6,003	187	7,728	3,534,909	10,193,301	13,728,210

Table 4 -- WAGE-EARNERS, BY MONTHS, 1941 and 1942 (Number on payroll on the last work day of each month)

	1 9 4 1			1 9 4 2		
	Male	Female	TOTAL	Male	Female	TOTAL
January	3,481	19	3,500	6,204	51	6,255
February	3,549	20	3,569	6,305	53	6,358
March	3,561	22	3,583	6,183	55	6,238
April	4,271	22	4,291	6,112	57	6,169
May	4,951	22	4,971	6,195	89	6,284
June	5,433	29	5,467	6,285	152	6,437
July	5,721	37	5,758	6,191	212	6,403
August	5,868	38	5,906	6,065	263	6,328
September	5,821	44	5,865	5,979	311	6,280
October	6,198	46	6,244	6,007	344	6,351
November	5,941	46	5,987	5,964	354	6,318
December	5,909	47	5,956	5,940	365	6,305
AVERAGE	5,059	33	5,092	6,117	187	6,304

Table 5 - HOURS WORKED PER WEEK BY WAGE-EARNERS, 1942 (In one week in month of highest employment; overtime included)

Hours worked per week -	Number of Wage-Earners				
	1 9 4 1		1 9 4 2		
	Male	Female	Male	Female	
30 hours or less	71	5	119	7	
31-43 hours	424	12	486	31	
44 hours	297	7	444	7	
45-47 hours	189	2	252	19	
48 hours	3,805	16	3,454	12	
49-50 hours	226	...	135	...	
51-54 hours	274	...	636	2	
55 hours	31	...	14	...	
56-64 hours	1,133	...	1,089	...	
65 hours and over	79	...	103	3	
Total	6,529	42	6,732	81	
Total wages paid in selected week	\$	133,437	674	226,276	2,031

Table 6 - FUEL AND ELECTRICITY USED, 1941 and 1942

Kind	Unit of measure	1 9 4 1		1 9 4 2	
		Quantity	Cost at works	Quantity	Cost at works
		\$		\$	
Bituminous coal—Canadian	ton	34,313	184,850	11,957	72,721
Foreign.	ton	214,900	1,203,838	291,875	1,733,476
Anthracite coal	ton	583	6,102	478	5,123
Coke	ton	145	1,564	629	7,317
Gasoline	Imp. gal.	146,890	28,966	168,018	35,745
Fuel oil	Imp. gal.	1,372,967	94,524	1,552,559	109,707
Gas—Manufactured	M cu. ft.	5,671	4,787	...	...
Natural	M cu. ft.	223,208	17,526	1,999,415	161,133
Other fuel	xxx	...	139,448	...	236,186
Electricity purchased ...	K.W.H.	1,451,786,982	4,019,902	1,786,859,206	5,253,951
TOTAL	xxx	...	5,701,507	...	7,615,359
Electricity generated for own use	K.W.H.	105,362,064	...	10,254,817	...

Table 7 - POWER EQUIPMENT, 1941 and 1942

Kind	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total rated horse power	Number of units	Total rated horse power
<u>1 9 4 1</u>				
Steam engines and steam turbines..	52	17,049	16	1,715
Diesel engines .....	...	...	1	65
Gasoline, gas and oil engines	1	35	2	200
Hydraulic turbines or water wheels	5	10,520	...	...
Total Primary Equipment	58	27,604	19	1,980
Electric motors operated by purchased power	3,904	97,052	470	9,071
TOTAL	3,962	124,656	489	11,051
Electric motors operated by above primary units	996	10,525	56	445
Stationary boilers	33	16,472	6	1,317
<u>1 9 4 2</u>				
Steam engines and steam turbines..	57	18,271	22	2,053
Diesel engines .....	...	...	1	65
Gasoline, gas and oil engines	2	135	2	200
Hydraulic turbines or water wheels	5	10,520	...	...
Total Primary Equipment	64	28,926	25	2,318
Electric motors operated by purchased power	4,928	115,325	844	17,317
TOTAL	4,992	144,251	869	19,635
Electric motors operated by above primary units	1,009	11,881	81	704
Motor generator sets	25	26,927	...	...
Stationary boilers	44	23,062	8	1,477

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 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 1942 was around \$100,200,000 compared with \$75,000,000 in 1941.

Table 8 - TOTAL PRODUCTION OF INDUSTRIAL CHEMICALS IN CANADA, 1941 and 1942

Commodity	Selling Value at Works	
	1941	1942
	\$	\$
<u>Acids, including acetic, muriatic, nitric, sulphuric, phosphoric, and stearic</u>	5,800,000	6,700,000
<u>Calcium Compounds, including carbide, chloride, phosphide, cyanamide, cyanide, acid phosphate, grey acetate, arsenate, chloride of lime, etc.</u>	16,300,000	16,900,000
<u>Sodium Compounds, including hydroxide, phosphate, silicate, hypochlorite, bisulphite, salt cake, Glauber's salt, chlorate, acid pyrophosphate, soda ash, sal soda, bisulphate, etc. (pharmaceutical salts included elsewhere)</u>	6,900,000	8,400,000
<u>Organic Chemicals, including acetic anhydride, butyl acetate, ethyl acetate, paraldehyde, pentasol acetate, vinyl acetate, ethyl alcohol, methyl hydrate, glycerine, phenol, cresol, benzol, etc. (acetic acid and acetylene included elsewhere)</u>	17,500,000	27,300,000
<u>Fine Chemicals and Precious Metal Salts, including salts of bismuth, mercury, potassium, sodium, ammonium, magnesium, silver, gold, uranium and radium</u>	3,100,000	3,900,000
<u>Compressed and Liquefied Gases, etc., including acetylene, carbon dioxide, oxygen, nitrous oxide, liquid sulphur dioxide, liquid chlorine, anhydrous and aqua ammonia, etc.</u>	10,300,000	13,600,000
<u>Ammonium Sulphate, Phosphate and Superphosphate</u>	6,400,000	7,800,000
<u>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, ammonium nitrate, etc.</u>	8,700,000	15,600,000
TOTAL	75,000,000	100,200,000

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