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B.F. Goodrich Chemical Company

Inter-Organization Correspondence

To H. E. Barrett
Location Louisville, Ky.

Date February 19, 1968
From M. M. Doughty
Louisville, Ky.

Subject VCl Stripping From Geon 351 With a Rodney Hunt

Introduction:

21201

In 1964 Geon 351 latex was successfully stripped on No. 2 Rodney-Hunt Evaporator in the Louisville Hycar Department. Evaluation of the Rodney-Hunt for stripping Geon Latex was not pursued at that time because the Sontrifuge appeared to be a better method. Because the Avon Lake Plant now states that the Sontrifuge is not effective, it is desired to activate the evaluation of a Rodney-Hunt for stripping VCl from Geon Latex.

Geon 351 was stripped from 0.26 to 0.04% Vinyl Chloride on January 17, 1968 on No. 2 Rodney-Hunt Evaporator (a No. 4) in the Hycar Department with jacket temperatures from 110° to 170°F at 300 gallons per hour feed rate. Latex used had been recovered in normal recovery strippers of Bldg. 121.

Conclusions:

The Rodney-Hunt Evaporator decreased residual VCl from 0.26 to 0.04% (chromatograph) with an increase in coagulum from 0 to 0.6% greater than 0.45 u by Millipore Filter. Particle size by Electron Microscope showed no significant differences for the control (.26% VCl) and latex stripped at jacket temperatures of 130 and 150°F.

Recommendation:

Continue investigation of the Rodney-Hunt Concentrator as secondary latex stripper following initial recovery stripping. Evaluation can begin about April 1, 1968 after a second paste concentrator has become operational.

Discussion:

Geon 351, stripped to 0.26% VCl in B-121, by normal recovery, was further stripped on No. 2 Rodney-Hunt Evaporator in the Hycar Department. Residual VCl was reduced to 0.04%. The evaluation was carried out in two series. The first series consisted of 130, 140, and 150°F jacket temperatures, and the second consisted of jacket temperatures of 110, 140, 160, and 170°F. Millipore Filter on the first series increased from 0 to 3.8%. Although no reason has been found for the higher Millipore Filter data on the first samples, neither 0.6 nor 3.8% is considered high for Geon 351.

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Prior to stripping, the latex was diluted to 49.7% and alkalinity was raised to 0.15% by addition of ammonia. Total solids of the concentrated product varied from 55.3 to 59.1% and alkalinity from 0.08 to 0.10%.

The maximum rate attained was 300 gallons per hour; 600 gallons per hour had been expected on this Rodney-Hunt (a No. 4). The cause of this reduced rate was heavy foam.

The Rodney-Hunt vacuum dropped from 28.7 in. Hg to 28.0 in Hg. as jacket temperature was increased from 110 to 170°F. With no foam carry over and only about 7 lbs. per hour of non condensables (VC1) the change in vacuum is unexplained. However, the 28 in. Hg vacuum caused no particular problems.

Acknowledgement

I would like to thank Lowell Grady for his cooperation in this evaluation.

M. M. Doughty

MMD:ols-37-68

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OPERATING AND LABORATORY DATA

Jacket Temp °F	Vacuum in Hg	Rotor Amps	Time at Set Conditions Minutes	Total Solids %	Brook. Visc. cps	Surface Tension dynes/cm ²	Alk %	Residual VCl %	Millipore Filter Cumm. % Retained SS 1.2 u .45 u
Control	-	-	-	49.7	13.5	40.5	0.15	0.26	0 0 0
110°	28.7	9	45	55.3	20.0	38.5	0.10	0.11	0 0 0
140°	28.3	9	20	57.7	31.5	39.5	0.09	0.08	0 0.2 0.6
160°	28.1	9	35	58.1	32.5	37.6	0.08	0.05	0 0.2 0.6
170°	28.0	9	20	59.1	34.0	39.3	0.09	0.04	0 0 0.6
130°	28.5	9	20	56.8	25.5	40.2	0.09	0.06	0 0 0.2
140°	28.3	9	15.	57.8	31.0	39.5	0.09	0.07	0 1.4 1.6
150°	28.2	9	15	58.8	32.5	38.9	0.09	0.04	0 0 3.8

Electron Microscope

	Dv	Du
Control	1965	1802
110°	-	-
140°	-	-
160°	-	-
170°	-	-
190°	1705	1603
140°	-	-
150°	1965	1802

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REPORT NO. 8

Evaluation of the Rodney-Hunt Concentrator as a stripper

Date: 4/21/69 and 4/22/69

Feed Latex: 351 from storage, T.S. = 55.6, % VC1* = 0.10,
Millipore = 1.0

Conditions				Results **			
T.S.	Rate	Temp.	Vacuum	T.S.	Spec.Gr.	% VC1*	Millipore
50.2%	390 GPH	110°F			1.185		
50.2%	480 GPH	130°F			1.185		
50.2%	510 GPH	150°F			1.190		
50.2%	340 GPH	110°F	29" Hg	55.8	1.183	.07	0.4
50.2%	560 GPH	110°F	29" Hg		1.175	.07	
50.2%	710 GPH	150°F	29" Hg		1.180		
50.2%	760 GPH	170°F	28.7" Hg	57.0	1.183	.07	0.4
47%	240 GPH	130°F	28.9" Hg	56.4	1.185	0.06	0.4
40%	420 GPH	150°F	28.8" Hg		1.175		
47%	600 GPH	150°F	28.8" Hg		1.167		
47%	760 GPH	190°F	28.6" Hg	53.0	1.167	0.05	0.4

* By Chromatograph

** No more tests were run because of the lack of difference in data shown.

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upper.

Autoignition temperature 472.22 deg.C.

The chances of autoignition are very remote in the Process Building. The critical point for steam is 3184 psi. at 374 deg. C.--almost 100 deg. C. below the auto-ignition temperature of vinyl chloride.

Vinyl chloride is not very toxic; it requires high concentrations to cause death. Single exposures survived by guinea pigs were 5 to 7 vol.% in air for one hour and 2½ vol.% for eight hours. The maximum time-concentration for a single exposure without serious disturbance was 1½ vol.% for one hour and 0.5 vol.% for eight hours.

Men exposed to 2½ vol.% for three minutes will become dizzy and disoriented. This was also noted at 6600 ppm. (0.66 vol%) for a 1/2 hour exposure by men. The threshold odor limit is 4100 ppm.

Repeated exposure of rats for seven hours/day, five days/week at 500 ppm. showed increased liver weight. This test probably contributed to the setting of 500 ppm. as the threshold limits of vinyl chloride for continued exposure by the American Conference of Governmental Industrial Hygienists.

I don't believe we are anywhere near the 500 ppm. level in Bldg. 414, but you cannot tell by smell, since 4170 ppm. is the threshold odor limit. To be sure, Paul Ormsby is going to call Akron to have them run some vinyl chloride vapor tests in Bldg. 414.

Unless we learn that the concentration exceeds 500 ppm. around Bldg. 414, you can continue venting the unreacted vinyl chloride from charges in Bldg. 414.

It is also worth noting that combustion of vinyl chloride forms hydrochloric acid, so burning vinyl chloride creates even a worse pollutant.

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