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INFORMAL REPORT

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PLAINTIFF'S EXHIBIT
UC-1475

TiO_2 CONTAMINATION OF RG-244 DURING T-135 PLANT RUN

Summary

RG-244 was produced during our last plant run of T-135, August 15 to August 22, 1973. It contained unacceptable levels of TiO_2, as expected, but some data were obtained which may indicate a way to hold contamination to lower levels during future T-135 runs.

There appears to be no correlation between TiO_2 content and thickening efficiency of RG-244, even at high levels of TiO_2.

Lots of RG-244 made during this period have been sold to selected customers, where TiO_2 could not be observed in their applications. No complaints have been received to date. This gives us an avenue for such material in the future and precludes the necessity for shutting down RG-244 production when every pound is badly needed.

Introduction

We have usually refrained from making RG-244 during those times when T-135 was being produced at King City. This was done because it had been observed that TiO_2 found its way into an early (circa 1968) batch of RG-244 causing an obvious cloudiness or turbidity in polyesters containing low levels, ca 1%, of the RG-244 product. At that time, it was determined that 500 parts per million (0.05%) TiO_2 was just barely discernible in the product. An RG-244 product specification was adopted allowing 500 ppm TiO_2 maximum.

During our most recent plant run of T-135 (August 1973) it was decided to continue to make RG-244. This was done because of the critical shortage of RG-244 and it was felt that any contaminated product could be sold to selected customers without problem. To a large extent this has been done with no complaints to date.

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The purpose of this experiment was to record the contamination levels which occurred. These, then, can serve as a guide to future procedures for RG-244 production during subsequent "T" runs in the main King City plant.

Experimental

Samples of each pallet of RG-244, numbers 9737 through 9877, made during the T run were retained. TiO_2 analyses were performed on selected lots at Niagara Falls. TiO_2 was estimated colorimetrically after dissolution from the asbestos samples. Standard viscosity and pH tests were also performed on selected samples. These results are tabulated along with quality control data from King City in the attached "RG-244 Product Analyses."

The TiO_2 test results are plotted on the attached graph vs. the running pallet numbers. Noted on the graph are the dates of the T run.

Discussion

These data show that TiO_2 begins to build up in the RG-244 circuit from the beginning of the T run, rises to a maximum, and tapers off after the run. This, of course, was expected but the high level, almost 3%, was a surprise. We would have estimated the maximum to be lower than that.

It should be noted that makeup water for the RG-244 circuit at the beginning of the run was plant recycle water. On August 20, the fifth day of the T run, makeup water was switched from plant recycle to fresh water. At that point, the TiO_2 level in the RG-244 being produced began to drop. We cannot be sure how high the TiO_2 level might have gone if this switch had not occurred.

In pallet 9861, the TiO_2 content took an excursion to 1.4 while pallets before and after that point were much lower in TiO_2. It seems probable that this may have been due to material being ground from a retained flow bin or that some stray TiO_2 was stirred up during the normal plant cleanup following the T run. All lots after pallet 9877 were below the allowable 500 ppm TiO_2. This occurred within two days after the conclusion of the T run.

Comparison of the viscosities and TiO_2 contents of the following pallets -

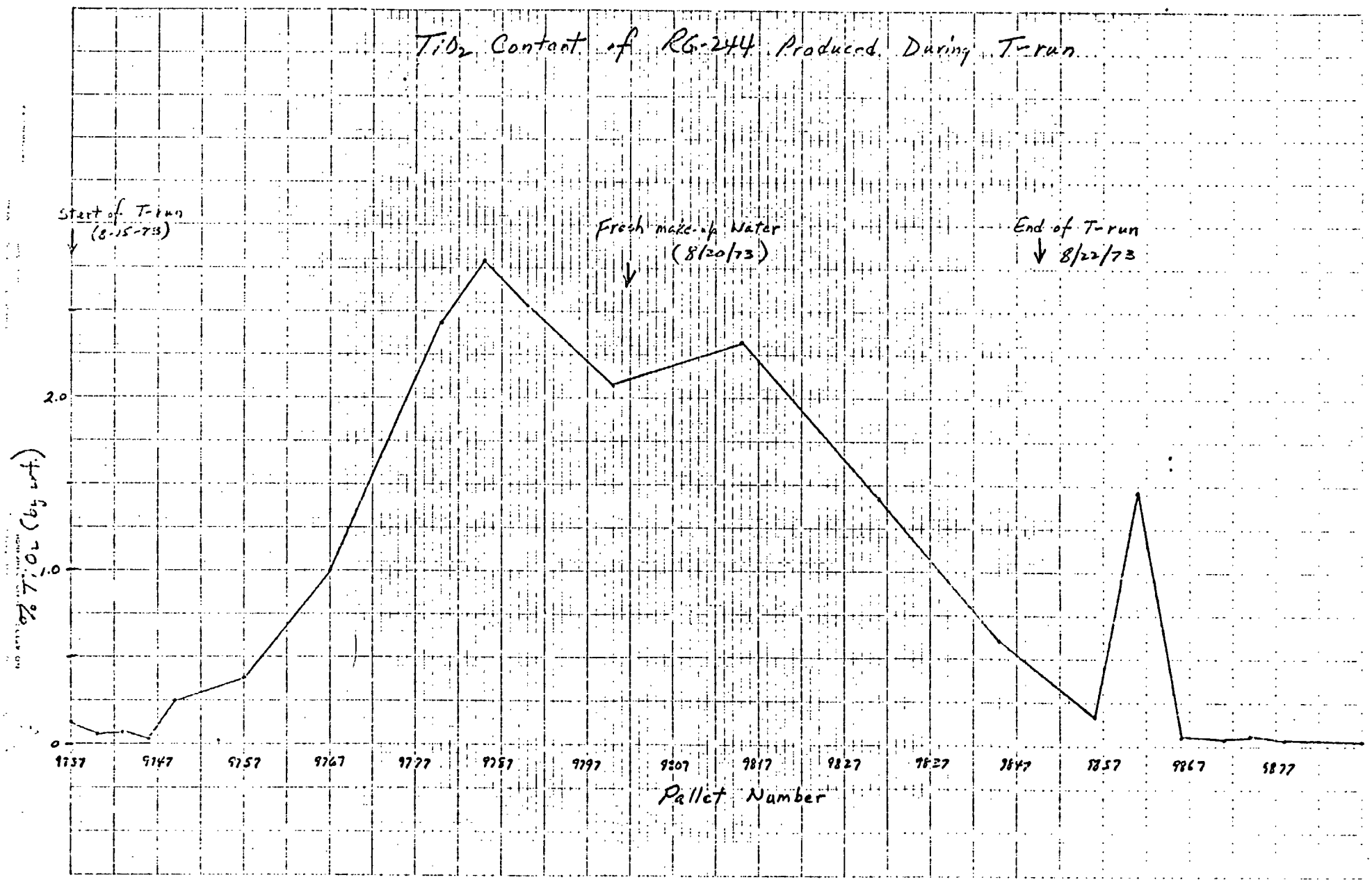
Pallet #	Viscosity, M cps	TiO_2, % by Wt.
9740	47	0.052
9780	41	2.44
9790	41	2.53
9800	43	2.08
9910	34	0.028

- shows that thickening efficiency is not reduced by relatively high TiO_2 content. There is, in fact, no correlation between viscosity level and TiO_2 content. This agrees with test results obtained at Niagara Falls by adding TiO_2 to specification-grade RG-244.

These observations indicate that we should repeat this experiment during our next T run. At that time, however, we should use only fresh makeup water in the RG-244 circuit to minimize TiO_2 contamination of the RG-244 product. It is essential that RG-244 production not be interrupted and we can apparently successfully market any resultant exceptional product.

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RG-244 Product Analyses

Pallet #	Date	KC Analyses pH	KC Analyses H_2O	KC Analyses Visc*	KC Analyses +200M	NF Analyses Visc*	NF Analyses pH	NF Analyses % TiO_2
9737	8/15	8.7	1.35	39	0.72			0.13
38	"	8.7	1.4	44	0.62			
39	"	8.7	1.4	44	0.66			
40	"	8.7	1.0	60	0.90	47	8.7	0.052
41	"	8.7	1.2	59	0.80			
42	8/16	8.7	1.3	49	0.72			
43	"	8.7	1.3	46	0.66			0.065
44	"	8.7	1.2	49	0.48			
45	"	8.7	1.4	43	0.72			
46	"	8.7	1.6	42	0.56			0.032
47	"	8.9	1.4	33	0.70			
48	"	8.7	1.2.	43	0.78			
49	"	8.6	1.0	36	0.72			0.25
50	"	8.6	1.1	33	0.76			
51	"	8.6	1.2	36	0.68			
52	"	8.7	1.2	34	0.80			
53	"	8.7	1.2	34	0.78			
54	"	8.7	1.2	31	0.78			
55	"	8.7	1.2	35	0.78			
56	"	8.7	1.2	28	0.78			
57	"	8.8	1.2	32	0.82			0.38
58	"	8.8	1.0	33	0.78			
59	"	8.8	1.1	36	0.72			
61	8/17	8.7	1.0	48	0.90	39	8.6	
62	"	8.7	0.9	43	0.62			
63	"	8.7	1.1	48	0.70			
64	"	8.7	1.1	45	0.60			
65	"	8.6	1.0	43	0.70			
66	"	8.6	1.0	42	0.54			
67	"	8.7	1.1	40	0.60			1.0
69	"	8.7	1.3	34	0.68			
70	"	8.7	1.0	42	0.52	39	8.7	
71	"	8.7	1.1	38	0.92			
72	"	8.7	1.0	37	0.84			
73	"	8.7	1.3	49	0.86			
74	"	8.6	1.0	43	0.96			
75	"	8.6	0.9	44	1.14			
76	8/18	8.6	1.0	44	0.72			

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RG-244 Product Analyses

Pellet #	Date	KC Analyses pH	H₂O	Visc*	+200M	NF Analyses Visc*	pH	% TiO2
97 77	8/18	8.6	0.8	42	0.48			
78	"	8.7	1.0	36	0.66			
79	"	8.6	1.0	41	0.84			
80	"	8.6	1.0	41	0.72	41	8.6	2.44
81	"	8.7	1.0	40	0.76			
82	"	8.7	1.0	34	0.74			
83	"	8.6	0.8	38	0.54			
84	"	8.6	1.0	30	0.70			
85	"	8.7	1.0	36	0.84			2.79
87	"	8.7	1.0	36	1.00			
88	"	8.6	1.0	40	0.98			
89	"	8.6	1.0	38	0.92			
90	"	8.6	1.0	38	1.06	41	8.6	2.53
91	"	8.6	1.0	43	0.90			
92	"	8.6	1.3	43	1.12			
93	"	8.7	1.0	44	0.84			
94	8/19	8.6	1.0	48	1.02			
95	"	8.6	1.0	47	1.00			
96	"	8.6	1.0	47	0.98			
97	"	8.9	0.9	46	0.90			
98	"	8.6	0.9	43	0.72			
99	"	8.6	0.9	45	0.84			
98 00	"	8.6	0.9	45	0.92	43	8.5	2.08
1	"	8.6	1.0	42	0.84			
2	"	8.7	1.0	30	0.68			
3	"	8.6	1.0	35	0.84			
4	"	8.7	0.9	35	1.38			
5	"	8.6	0.9	35	1.12			
6	"	8.6	1.0	37	0.96			
7	"	8.6	1.2	38	1.02			
8	"	8.7	1.0	41	1.10			
9	8/20	8.6	1.0	40	0.96			
10	"	8.6	0.9	38	0.92	38	8.6	
11	"	8.7	1.0	38	0.84			
12	"	8.6	0.9	38	0.90			
13	"	8.6	0.9	36	1.04			
14	"	8.6	1.0	35	0.84			
15	"	8.6	1.0	36	0.72			2.32

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RG-244 Product Analyses

Pallet #	Date	KC Analyses pH	KC Analyses H₂0	KC Analyses Visc*	KC Analyses +200M	NF Analyses Visc*	NF Analyses pH	NF Analyses % TiO₂
9816	5/20	8.7	0.8	40	0.98			
17	"	8.6	0.9	35	0.80			
18	"	8.7	1.0	35	0.80			
19	"	8.6	1.0	34	0.82	39	8.6	
20	"	8.4	1.2	36	1.42			
21	"	8.5	0.9	32	1.12			
22	"	8.7	0.9	32	1.14			
23	"	8.8	1.0	34	1.00			
24	"	8.8	0.9	40	1.16			
25	"	8.8	1.2	42	0.78			
26	5/21	8.8	1.2	41	0.68			
27	"	8.8	1.1	35	0.58			
28	"	8.8	1.2	32	0.62			
29	"	8.8	1.2	29	0.78			
30	"	8.7	1.2	29	0.74	31	8.6	
31	"	8.7	1.1	27	0.60			1.41
32	"	8.6	1.0	27	0.60			
33	"	8.6	1.2	32	0.60			
34	"	8.6	1.0	31	0.88			
35	"	8.7	1.1	29	0.94			
36	"	8.6	1.0	30	0.90			
37	"	8.6	1.15	34	0.88			
38	"	8.6	1.0	35	0.96			
39	5/22	8.7	1.0	38	0.80			
40	"	8.7	1.1	42	0.76	38	8.6	
41	"	8.7	1.2	38	0.72			
42	"	9.0	1.2	32	0.74			
43	"	8.8	1.0	33	0.68			
44	"	8.7	1.0	42	0.74			
45	"	8.7	1.2	30	0.64			0.6
46	"	8.7	1.1	40	0.50			
47	"	8.6	1.3	32	0.66			
48	"	8.6	1.2	33	0.82			
49	"	8.6	1.0	34	1.0			
51	"	8.5	1.2	35	1.02	37	8.5	
52	5/23	8.6	1.1	44	0.96			
53	"	8.6	1.2	37	0.89			
54	"	8.6	1.1	40	0.83			

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RG-244 Product Analyses

Pallet #	Date	ICC Analyses pH	ICC Analyses H2O	ICC Analyses Visc*	ICC Analyses +2.00M	NF Analyses Visc*	NF Analyses pH	NF Analyses % TiO2
98 55	8/23	8.6	1.3	49	0.76			
56	"	8.6	1.0	40	0.74			0.16
57	"	8.6	1.3	26	0.70			
60	"	7.6	1.0	26	0.58	34	8.6	
61	"	8.1	1.0	31	0.66			1.46
62	"	8.5	1.0	32	0.68			
63	"	8.7	1.0	27	0.70			
64	"	8.4	1.1	27	0.82			
65	"	8.5	1.1	31	0.74			
66	"	8.4	1.1	27	0.60			0.05
67	"	8.5	1.0	32	0.76			
69	8/24	8.5	1.1	25	0.68			
70	"	8.4	1.1	28	0.54	28	8.5	
71	"	8.4	1.3	26	0.86			0.045
72	"	8.4	1.2	28	0.82			
73	"	8.5	1.4	27	0.86			
74	"	8.5	1.2	27	0.82			0.053
75	"	8.4	1.3	25	0.80			
76	"	8.5	1.1	21	0.80			
77	"	8.4	1.0	23	0.72			
78	"	8.3	1.2	23	0.62			0.043
79	"	8.3	1.2	21	0.54			
80	"	8.3	1.2	22	0.60	27	8.3	
98 88	8/25	8.5	1.2	27	0.52			0.030
89	"	8.5	1.2	26	1.58			
90	"	8.5	1.2	24	0.56	32	8.5	
91	"	8.4	1.2	28	0.52			
92	"	8.4	1.4	33	0.55			
93	"	8.4	1.3	31	0.53			0.037
99 00	"	8.6	1.0	24	0.78			
10	8/26	8.6	1.2	36	0.76	34	8.5	0.028
20	"	8.2	1.0	29	0.80	28	8.5	0.016

* Visc in cps x 10^{-3}

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