Monsanto

FROM ANNISTON, ALABAMA

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SUBJECT COMPARE SANTOWAX FLASH STILL RECOVERY WITH BATCH STILL RECOVERY

REFERENCE

TO H. L. Williams

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Summary:

The new continuous Santowax R flash still operates at an 80-85% recovery as compared with discontinued batch still's 90-94% recovery. The approximate 10% less recovery of Santowax R, as compared with the 1966, is due to the temperature-vacuum operating conditions of the flash still which are necessary to produce acceptable Santowax R. Santowax R produced at higher recovery levels is changed in composition from batch still Santowax R so that neither HB-40 or Aroclor 5460 can be produced. The HB-40 produced is above specification color and Aroclor 5460 cannot be satisfactorily chlorinated and distilled. CED proposes the installation of a rectification column on the flash still to allow production of a Terphenyl free Montar 9, and a Santowax R of 14% max. quaterphenyl. This modification will result in improved overall polyphenyl costs.

Details:

1. The standard credit for Santowax R was 119 lbs. Santowax C/100 lbs. Santowax R for a number of years. This credit converts to benzene on the Biphenyl cost sheet and is shown as benzene yield.

2. The normal batch still operation, for a number of years, was to charge the pot and distill Santowax R for three charges and then to pump out the bottoms (Montar 9). The distillation was normally through a 12 plate bubble tray. During periods of high demand, the column was by-passed and distilled off at a higher rate. The column was the preferred method, since it produced material that gave the best colored HB-40.

3. A record of the bottoms in each still has been kept and plotted as a control measure for a number of years. These measurements are the basis for the percent Montar 9 for the period October '65 through November '66, Column 5 and 6. These measurements are subject to error.

4. An approximate 90% recovery was shown through February 1966. At this time the demand for Santowax increased beyond the capacity of the still, and operating conditions were changed in March to boil down four times before discarding the Montar 9. This move reduced the throwaway by approximately 25% and saved operating time. Additional time was saved by moving to the by-pass distillation in May 1966. HB-40 color increased at this time to the upper limit of the color specification. Aroclor 5460 operations were satisfactory. It was recognized that the increased recovery would increase the Aroclor 5460 still bottoms, since the quaterphenyl-plus level of the Santowax R was increased.

Montar 9, under these conditions, contained a negligible amount of Terphenyl.

5. The results of these moves made 1966 the best benzene yield year ever obtained. The 1967 variance figures are based on these recoveries.

6. The improvements in Santowax R are shown in Column 3. As the Santowax R recovery was increased, the usage of Santowax C was dropped from 119 to 110 lbs/100 lbs. Santowax R.

7. It was necessary to increase the usage back to 116 lbs. in February 1967 after the flash still was placed in operations.

8. The percent Montar 9 in Column 5 was obtained by measuring each flash still charge pumped to the pond. The Santowax R value was obtained by measuring each pumping of Santowax R to the vertical storage tank. These measurements are subject to error.

9. The initial flash still conditions of 370°C and 40 mm made a fair recovery; however, it changed the Santowax R composition so the quaterphenyl-plus content was 17% and higher while leaving 10-20% Terphenyl in the bottoms. This material stopped both the HB-40 and the Aroclor 5460 process.

10. The flash still conditions were changed to reduce the quaterphenyl content below 15%. This move increased the Terphenyl content of the bottoms. The increased throwaway is the price of continued operations. The loss is partially compensated from increased Aroclor 5460 yields, since there is less quaterphenyl to be thrown away in the Aroclor bottoms.

11. The benzene yields shown in Column 3 are from the cost sheet amounts. The adjusted yield in Column 4 allows a better overall evaluation of the effect of changes to the Santowax R conditions by using the same Santowax C credit (110 lbs/100 lbs.) for each month. The marked decrease occurs following the start-up of the flash still. This is substantiated by the 16-25% Terphenyl shown by analysis in the Montar 9 stream.

B. O. Severson

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Att.

TABLE I

EFFECT OF CHANGING SANTOWAX STILL CONDITIONS ON PERCENT SANTOWAX R RECOVERY - OCTOBER 1965 - APRIL 1967

Date	Unadjusted Biphenyl Yield Benzene %	Benzene Credit Basis # S-C/100# R	Adjusted Biphenyl Yield (110#) %	Estimated % Montar 9	% Recovery Santo. R from Santo. C - %	Remarks
Oct. '65	101.7	119	99.8	9.4	90.6	3 Boil Downs
Nov.	98.8	119	97.4	9.7	90.3	370° @ 15 mm
Dec.	100.6	119	98.9	9.6	90.4	Normal end cond.
Jan. '66	99.0	116	97.8	9.1	90.4	
Feb.	101.1	116	98.8	9.7	90.3	
Mar.	103.2	116	100.4	6.8	93.2	4 Boil Downs Start
Apr.	99.0	116	97.2	7.9	92.1	
May	100.8	110	100.8	7.7	92.3	Start using 8" By-Pass
June	100.8	110	100.8	7.3	92.7	
July	100.2	110	100.2	6.7	93.3	
Aug.	100.5	110	100.5	6.2	93.8	
Sept.	102.8	110	102.8	6.3	93.7	
Oct.	99.9	110	99.9	6.4	93.6	
Nov.	101.1	110	101.1	6.3	93.7	Last month on Batch Still
Dec.	97.8	110	97.8	--	--	Start Flash Still 370°C and 40 mm
Jan. '67	97.7	110	97.7	--	--	Bad HB-40-Aroclor 5460 Double Dist.
Feb.	97.7	116	96.1	14.5	85.5	Flash Still 320°C
Mar.	95.5	116	93.4	17.5	82.5	" " "
Apr.	97.0	116	95.0	17.7	82.3	" " "

Calculated by: B. D. Ward

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