

KES

Analysis of Styrene in SBR

KES T – M179

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1. Scope of Application

This standard shall specify the analyzing method of styrene in SBR.

The styrene here implies residual styrene, combined styrene and total styrene.

2. Residual Styrene

2.1 Apparatus and Reagent

- (1) Flask : It should has a cap and the capacity is 250 mL.
- (2) Solvent : P-butylcarecole III is mixed with methyl alcohol to be 100 ppm.
- (3) Methyl alcohol
- (4) Brome solution (0.1 N) : It follows 2 (28) of KS M 8006.
- (5) Sulfuric acid : 18 % solution
- (6) Iodine kali solution: It is 10% solution and is manufactured by KS M 8229.
- (7) Thio sulfuric acid sodium solution (0.1 N) : It follows 2(34) of KS M 8006.
- (8) Starch solution: It follows 3 of KS M 8006.

2.2 Method

- (1) 25 g of specimen is put in the 250 mL of flask and the weight is measured up to 0.1 g.
Then, 25 mL of distilled water is added.
- (2) 25 mL of solvent with 100 ppm is added and the distilling device of glass joint with grinding & adjusting is attached on the flask as figure 1. Then, the mixture is distilled.
- (3) The initial 25 mL of distillate and 500 mL of iodine is moved to the flask. Then, the cooling device is washed with 20 mL of methyl alcohol and the washed solution is added to the iodine flask.
- (4) 20 mL of brome solution with 0.1 N is added by burette and cooled down to 30 °C.
Then, 15 mL of 18 % sulfuric acid is quickly added and shake with the cap on.
At this moment, the distilled water is filled on the funnel shaped place on the flask cap to have no leak of steam and the flask is left for one minute.

If it does not turn to yellow color, 10 ml of brome solution with 0.1 N is added until the yellow can appear for 60 seconds.

- (5) When brome solution is added with burette, it is first added to the funnel shaped place and then the cap is lifted up for the solution to go in along the circumference of cap. With the same method, the funnel shaped place is washed with distilled water and it is filled up with distilled water.
- (6) When the mixed solution turns to yellow, 10 ml of 10 % iodine potassium solution is added with the same method. Iodine, which is isolated by shaking flask, is titrated with 0.1 N thio sulfuric acid sodium solution until it turns to lemon yellow. 1 ml of starch solution is added and titration is continued until the blue disappears.
- (7) When titration is completed, the content of residual styrene is calculated by the following equation.

$$R_s (\%) = \frac{5.207 (K \times K_N - N \times N_N)}{W} \times 100$$

Where, R_s : Weight of specimen (gr)

W : Weight of specimen (gr)

K : Employed quantity of 0.1 N brome solution

K_N : Specification rate of 0.1 N brome solution

N : Employed quantity of 0.1 N standard thio sulfuric acid sodium

N_N : Specification rate of 0.1 N standard thio sulfuric acid sodium