Method to determine free acid in tall oil spent acid

Scope

This method describes a titrimetric method for determining the free acid in tall oil brine (spent liquor). This method, like PCTM 14, is important in ensuring correct acidulation of soap as the presence of excess free acid in tall oil can cause corrosion of distillation equipment.

Apparatus

1. Beaker, 600-mL.
2. Magnetic stirrer and stir bar.
3. Buret, 50-mL capacity.

Reagents

1. Potassium hydroxide, 0.25 N solution, standardized to ± 0.001.
2. Phenolphthalein indicator, 1%.

Procedure

1. Weigh 10 g of the spent acid sample into a 600-mL beaker.
2. Add 200 mL of distilled water and 1 mL of phenolphthalein indicator.
3. Stir using a magnetic stirrer and titrate with standard potassium hydroxide to appearance of the first permanent faint pink color.

Calculations

$$\textit{Free acid, mg KOH per g of sample} = \frac{A \times N \times 56.1}{W}$$

$$H_2SO_4, \% = \frac{A \times N \times 4.9}{W}$$

where:.

A	=	KOH solution, mL
N	=	normality of KOH solution
W	=	weight of sample, g
56.1	=	equivalent weight of KOH
4.9	=	equivalent weight of sulfuric acid/10 . This is used in the equation to express the water-soluble acid as sulfuric acid.

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