

PHENOL FURFURAL POLYMER

A Chem Ed

TESTED
DEMONSTRATION

Submitted by: Gregers Østrup, The Technical University of Denmark, Copenhagen.

Checked by: Vance Hamilton, Michigan State—NSF Traveling Science Teacher.

PREPARATION

Prepare a stock solution of "liquid phenol," i.e., phenol containing approximately 10% water. Provide furfural (technical grade suitable), a 7-cm porcelain dish, concentrated hydrochloric acid and a spatula.

DEMONSTRATION

Pour 10 ml of "liquid phenol" and 10 ml of furfural into the porcelain dish and mix thoroughly with a spatula. Add 5 ml concentrated hydrochloric acid very slowly with continuous stirring. Caution: spattering may occur. Provide for removal of fumes. The mixture turns almost black with the evolution of

considerable heat. Allow the mass to stand until the following day, when it is readily removed from the dish and should be washed and dried. The full strength of the polymer is obtained in about one week.

REMARKS

The washed polymer cake may be passed among the students with instructions to break it. A freshly prepared cake, that is, one which is 24 hours old, is easily broken but is much more difficult to break when it has been aged for a period of a week or more. The characteristic odor of the ingredients may be noticed. The material should be handled carefully, since it may contain small drops of hydrochloric acid in cavities.

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CHROMATE-DICHROMATE EQUILIBRIUM

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DEMONSTRATION

Submitted by: James J. Bohning, Wilkes College, Wilkes-Barre, Pennsylvania.

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PREPARATION

Provide four 25-× 200-mm test tubes and the following solutions: 2 M AgNO₃, 0.5 M K₂Cr₂O₇, 0.5 M K₂CrO₄, 1 M BaCl₂, 1 M NaOH, and 3 M HNO₃.

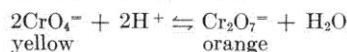
DEMONSTRATION

Fill two test tubes with K₂CrO₄ and add HNO₃ to one test tube dropwise. Compare colors and explain. Add AgNO₃ to each test tube (formation of red precipitate). To a third tube containing K₂CrO₄ add HNO₃ to

change the color, then add NaOH to return the original yellow color. To the fourth tube containing K₂Cr₂O₇ add BaCl₂ (formation of yellow precipitate).

REMARKS

This demonstrates the equilibrium



The formation of the yellow BaCrO₄ indicates the reverse reaction of K₂Cr₂O₇ with water to form some CrO₄²⁻.

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