PS

THE PREPARATION OF PHENOL-FORMALDEHYDE FOAMUNDER MICROWAVE IRRADIATION

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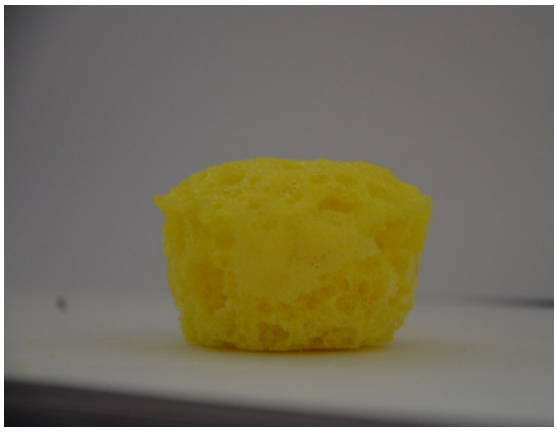
Phenolic foams prepared from phenol formaldehyde resoles have been known for many years. It is generally agreed that phenolic foams have the best fire rating of any known foam insulation. Phenolic foams do not burn even when contacted by the flame of a blow torch and give off minimal amounts of toxic gases. Phenolic foams can stand temperatures of 220° C without serious degradation.The general method for the continuous manufacture of phenolic foam insulation board is as follows. The foamable phenolic resole composition is prepared by continuously feeding into a suitable mixing device the aqueous phenol formaldehyde resole, the blowing agent, the surfactant, the optional additives, and the acid curing catalyst. The ratio of these ingredients is varied depending on the density, thickness, etc. desired in the final product. The mixing device combines these ingredients into a substantially uniform mixture which is continuously applied evenly onto a moving substrate, usually a protective covering such as cardboard which adheres to the foam. The foaming composition is usually covered with another protective covering such as cardboard which becomes adhered to the phenolic foam. The covered foaming composition is then passed into a double belt press type apparatus where the curing exotherm continues to vaporize and expand the blowing agent, thereby foaming the composition as it is cured.This process takes a lot of time and up to a dozen different auxiliary reagents are spent on its implementation [1].

We have been synthesis of phenol-formaldehyde foamfrom phenol and urotropineunder microwave irradiationin household microwaveoven. Other reactants haven't been used. The process takes 3-5 minutes [2,3].

Phenol: Urotropine (8:2); 3 min, 200W



Phenol: Urotropine (6:4); 3 min, 500W

References

1. Pat. US 4539338. Phenol formaldehyde resoles for making phenolic foam. 27.07.1984.
2. Pat. KZ 32636. Preparation of phenol formaldehyde foam under microwave irradiation. 08.01.2018.
3. D.P. Khrustalev, M. Ibraev, O. Tyagunova. The preparation of phenol formaldehyde foam under microwave irradiation. Step by step instruction of preparation of of phenol formaldehyde foam under microwave irradiation. Lambert Academic Publishing. Saarbrucken. 2017. 60 p.

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