A Study of Preparation of Fire-Retardant Exterior Wall Thermal Insulating Foam with a New Type of Raw Material

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A new kind of fire-retardant thermal insulating polymer material was studied. In order to improve the brittleness of phenolic foam and reduce its production cost, the tar crude phenol was used as raw material to replace part of pure phenol for the preparation of phenolic resin. The fluoride-free foaming technique was applied to prepare phenolic foam. A kind of binary curing agent was used to achieve the low acid curing. The impacts of dosage of vesicant, curing agent and surface active agent, the viscosity and the solid content of the resin, and the temperature on phenolic resin foaming at low temperature were studied by single factor test. For the phenolic foam prepared under the optimal conditions, the oxygen index is determined as 35, which means the fire resistance is excellent. The heat conductivity coefficient is 0.028w/(m.k) and the compressive strength is 0.32MPa. The main properties accord with the standards of exterior wall thermal insulating materials.

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