

Influence of alumina silicates on the crosslinking of phenolic resins

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Phenolic resins are used mainly as a binder for abrasive articles, plywood. They possess very high thermal and chemical resistance. The efficiency of the bounded abrasive tools depends essentially on the crosslinking of phenolic resin. It was shown that zeolites can accelerate the crosslinking reaction of the phenolic resins. It was shown that acidic form of zeolite can accelerate effectively hardening (crosslinking) of phenolic resins. Nowadays, hardening of phenolic resins in abrasive products is carried out for 28 h at 180°C and hexamine is used as hardener that causes emission harmful compounds such as: ammonia, formaldehyde. Thus, partial (or complete) replacement of hexamine by catalytically active filler brings tangible benefits such as: lowering the temperature of the crosslinking, shortening the time of the hardening process, the reduction (or elimination)

of hardener amount and thereby reduction of emitted harmful compounds, the possibility of improvement of the thermo-mechanical properties of the final composite. An important advantage of the using the modified aluminosilicates as filler for production of abrasives is the fact that the filler is a component always added to the composition used for the manufacture of abrasive tools. Rheology was used for testing crosslinking process of the phenolic resins in the presence of the different aluminosilicates. The rheological studies indicated that the tested aluminosilicates influence significantly on the hardening process of phenolic resins: the change of melting point, gel point and kinetic of crosslinking process.

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