

## Investigation of the Catalytic Activity of a Fly Ash-Based Zeolite on Phenol Alkylation with Diethyl Carbonate

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Type X zeolites synthesized from coal fly ash were employed as substrates for developing catalysts with improved performance. The synthetic zeolites were tested in the gas-phase as basic catalysts for phenol alkylation using diethyl carbonate (DEC) as innovative alkylating agents and their efficiency was compared. The results indicate that the newly-formed zeolites are very selective for the O-ethylation of phenol also at higher temperature. The zeolite obtained with sea water shows a higher yield for phenetole (84%) than the zeolite obtained with distilled water (78%). At low temperature phenol conversion was higher than 95% with the expected high selectivity to phenetole. In these

conditions we found that catalysts were active for more than 5 hours showing only a slight deactivation, probably due to the deposition of heavier carbonaceous compounds, with a phenetole yield decreasing from 90 to 78%. The less crystalline zeolite gave lower phenol conversion that increased with the reaction temperature. This was probably due to its lower surface area compared with the more crystalline zeolites. The catalytic activity of the zeolites synthesized from coal fly ash with this method gives high yields, is clean, cost effective, environmentally friendly which make the fly ash-based zeolites efficient catalysts and alternatives for industrial applications.

### Biography:

Arjan Korpa received his PhD with distinction from the University of Siegen, Germany in 2005. From 2011 to present he is working as an Associate Professor at the Faculty of Natural Sciences, University of Tirana, Albania. Doing research and development on innovative materials based on waste and industrial by-products. Recently doing research on new catalysts based on synthetic zeolites obtained from industrial by-products. From 2008 – 2011 served as Head of R&D of the Environmental Building Materials group, Beirut, Lebanon. From 2007 – 2008 worked for the Swiss Institute for Technical Research and Consulting, Wildeggen, Switzerland on Product development and Consulting.