# Catalytic mechanism of phenol alkylation with diethylcarbonate using a nanostructured synthetic zeolite

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Abstract

In this study, type X zeolites were synthesized from fly ash by pre-fusion method followed by hydrothermal treatment. The synthesis was performed by a pretreated with hydrochloric acid, with low crystallization temperature (60 °C) using both seawater and distilled water [1]. The synthetic zeolites from fly ash were employed as substrates for developing catalysts with improved performance [2]. They were tested via the base-catalyzed gas-phase alkylation of phenol using diethyl carbonate as an innovative alkylating agent, thus obtaining phenol conversions up to 95% with a selectivity of more than 85% in phenetole. Moreover, the results show that the zeolites formed from fly ash have a greater catalytic activity than that shown by commercial NaY and synthetic MgO, which were chosen as basic reference catalysts [3]. The catalytic activity of the zeolites synthesized from fly ash gives high yields, is clean, cost effective, environmentally friendly which make the fly ash-based zeolites efficient catalysts and alternatives for industrial applications.

## References

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[2] Tabanelli T., Monti E., Cavani F., Selva M. Green Chem. 19 (2017) 1519–1528.
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## Figures

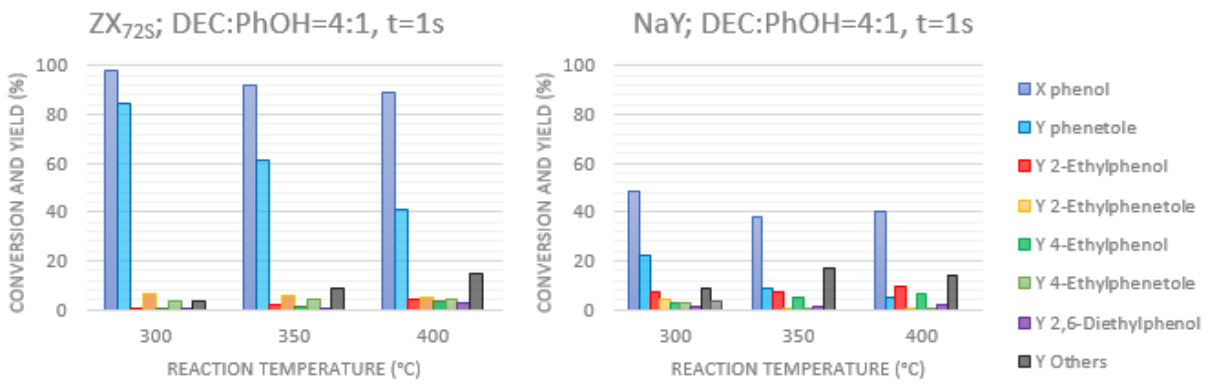


**Figure 1.** Catalytic results obtained from zeolite synthesis $ZA_{72S}$ (left) and commercial NaY (right) based on reaction temperature. Reaction condition: DEC:phenol molar ratio 4, τ=1s.