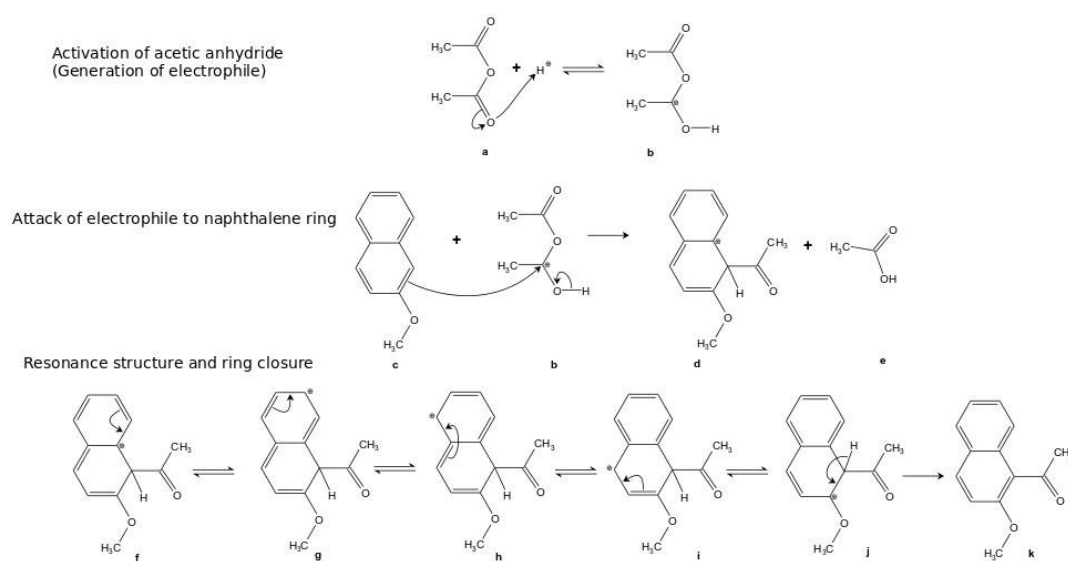


## Electronic Supplementary Information

### Enhancement in activity and shape selectivity of zeolite BEA by phosphate treatment for 2-methoxynaphthalene acylation

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**Scheme S1.** Plausible mechanism of acylation of 2-methoxynaphthalene with acetic anhydride over acid catalyst

Acetic anhydride ((AC)<sub>2</sub>O) (Scheme S1a) is activated by the attack of H<sup>+</sup> on one of the ketonic oxygens resulting in the generation of electrophile (Scheme S1b). This electrophile attacks the naphthalene ring depending on the electron density over the carbon atoms and attack on the first carbon is taken as example here (Scheme S1c). Attack on the first carbon (Scheme S1d) results in electron transfer from ring to electrophile and as a result, electron deficient site is generated on the ring. It resonates through the structures Scheme S1f - Scheme S1i and ring closure happens by the removal of proton from the first carbon atom (Scheme S1j) resulting the product 1,2MNAC and acetic acid as byproduct (Scheme

S1e). Similarly, formation of all isomers can be explained. However, within the pores of zeolite, formation of the product depends upon the bulkiness of the intermediate states. Product with stable intermediate is the major product over zeolite catalyst.