Removal of benzoic acid in heavy oils through esterification with methanol

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The removal of naphthenic acids including benzoic acid in crude oils is an important process in petroleum refineries due to their severe corrosion problems. Owing to the recent increasing demand of heavy oils having a high TAN (total acid number), the catalytic esterification with methanol to neutralize the acid components seems to be one of the possible methods to remove the naphthenic acids from crude oils. The active sites for esterification of benzoic acid with alcohols are generally known to be Bronsted and (or) Lewis sites. In the present study, the conversions of benzoic acid were investigated by using the modified Ferrierite and ZSM-5 zeolites in a batch reactor. The surface properties of the modified Ferrierite and ZSM-5 were characterized using XRD, NH_3-TPD and Py-IR analyses.