Electronic Supplementary Material (ESI) for Chemical Science

Multi-functionality of Ga/ZSM-5 catalysts during anaerobic and aerobic aromatisation of *n*-decane

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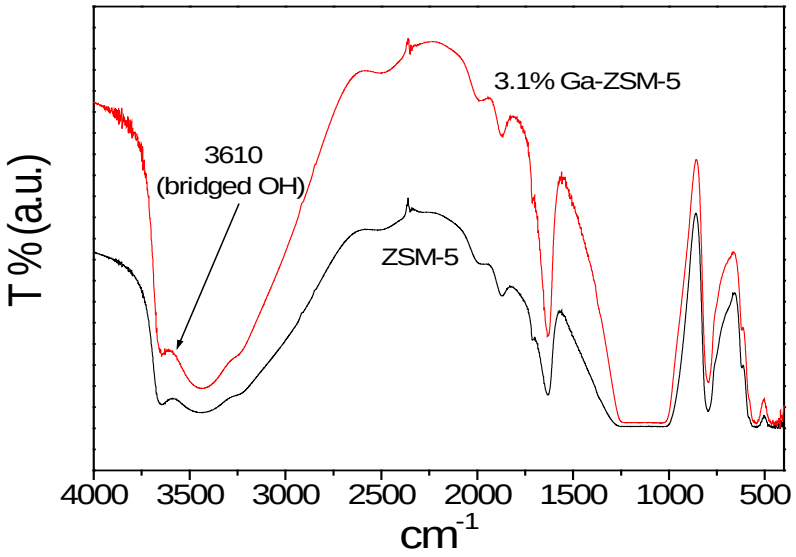
FT-IR detection of bridged hydroxyl species responsible for Brönsted acidity in ZSM-5

Sample preparation: ZSM-5 and 3.1%Ga/ZSM-5 were ground in KBr and pressed into discs.



FT-IR spectra of ZSM-5 and 3.1%Ga-ZSM-5.

Results and discussion: The complex vibrational spectrum of a zeolite includes the bridging hydroxyl groups (Si-OH-Al) responsible for Brönsted acidity, which give rise to IR absorption at 3610 cm^{-1} [a]. As seen in the figure above, no significant difference between the parent and Ga-modified zeolite was observed at this frequency, indicating that there was no substantial exchange of Brönsted acid sites by ionic gallium [b].

a. V de O Rodrigues et al., J. Phys Chem. C., 114 (2010) 4557

b. M Garcia-Sanchez et al., J. Catal., 219 (2003) 352