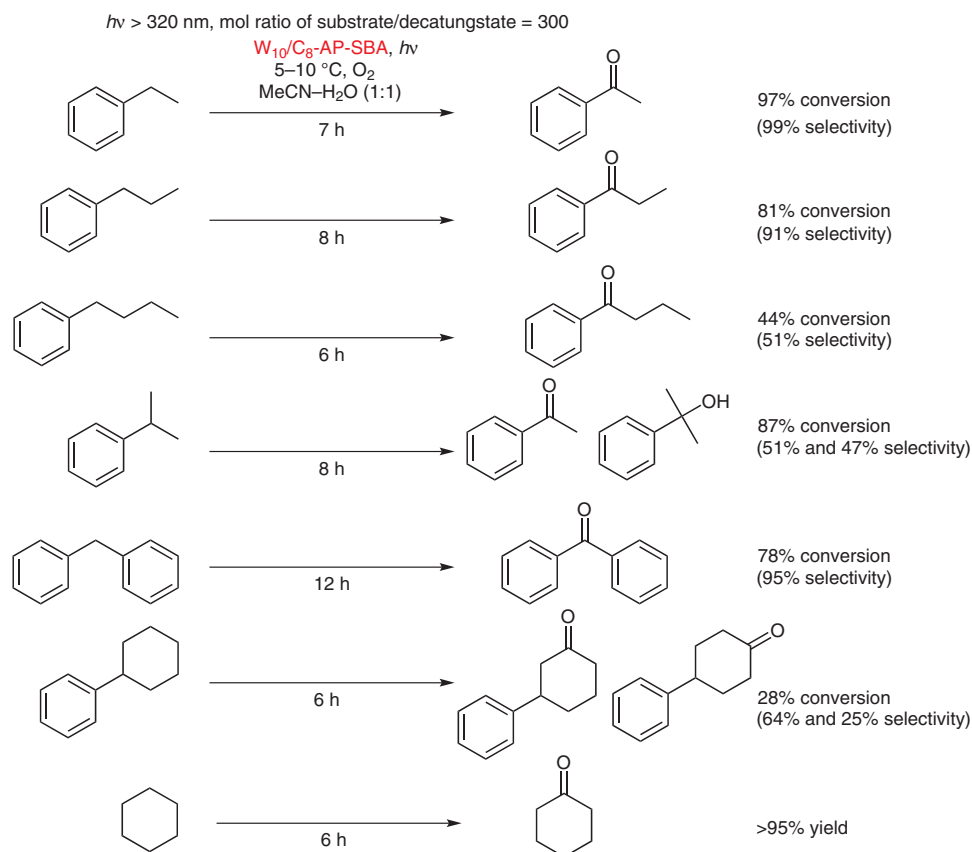


Photooxidation of Alkanes Using $W_{10}O_{32}^{4-}$ on Organomodified SBA-15



Significance: Photooxidation of alkanes using decatungstate $W_{10}O_{32}^{4-}$ on a novel hydrophobically-organomodified SBA-15 as catalyst was described. The catalyst W_{10}/C_8 -AP-SBA ($W_{10}=[W_{10}O_{32}^{4-}]$, C_8 = octyl group, AP = 3-aminopropyl group) was prepared by treatment of $C_8H_{13}Si(OEt)_3$ with SBA-15, grafting with 3-aminopropyl amine, acidification with CF_3SO_3H and ion exchange by decatungstate. W_{10}/C_8 -AP-SBA showed photocatalytic oxidation activity for various alkanes under mild conditions to afford the corresponding ketones (7 examples, 28–97% conversion).

Comment: Elemental analysis using ICP showed that W_{10}/C_n -AP-SBA gave ca. 12wt% loading of decatungstate. After the first oxidation of ethylbenzene, the catalyst was separated from the reaction mixture by filtration. The recovered catalyst was reused five times without any loss of catalytic activity. TEM and IR analysis showed no change in the nanostructure of the SBA-15 support and decatungstate species of the fifth reused catalyst, respectively. It was confirmed by ICP analysis that the W content in the used W_{10}/C_8 -AP-SBA catalyst was the same as that in the fresh catalyst and that no W was detected in the filtrate.

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