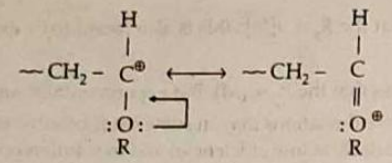
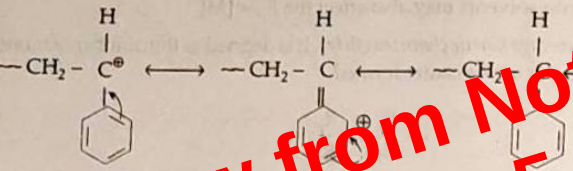
(i)



(ii)

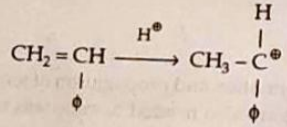


The mechanism of cationic polymerisation can be explained by the polymerisation of (a) Styrene using $Sn Cl_4$ as catalyst and (b) Isobutylene using BF_3 as catalyst and water as a co-catalyst (or protogen or initiator) since it supplies the proton which ultimately adds to monomer to initiate polymerization. (Note that BF_3 alone cannot start the polymerization).

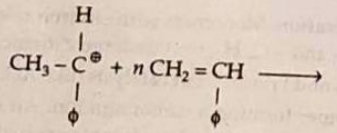
(a) Polymerization mechanism of styrene $\left(CH_2 = CH\right)$

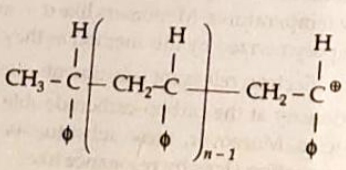
where ϕ stands for $C_6 H_5$

Initiation : $SnCl_4 + H_2O \longrightarrow [SnCl_4 . OH]^{\ominus} + H^{\oplus}$



Propagation :





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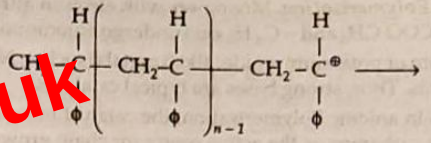
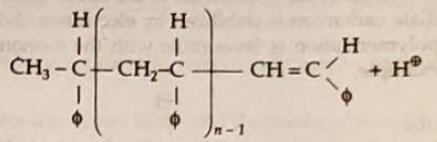
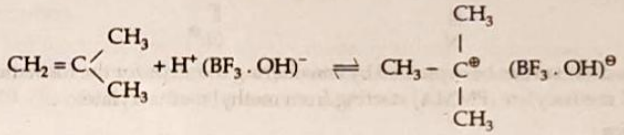




(b) Polymerization mechanism of isobutylene

Initiation : $BF_3 + H_2O \rightleftharpoons (BF_3 . OH)^- (H)^+$



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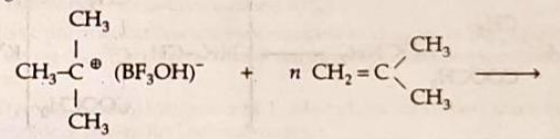

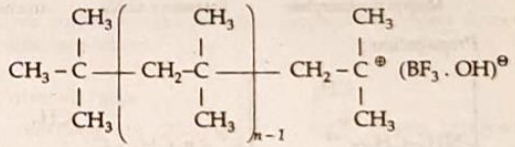

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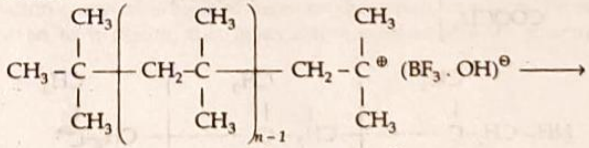

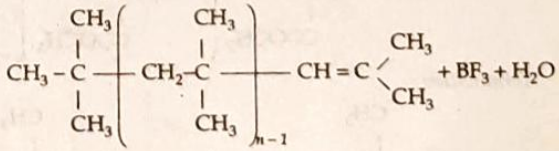

or