Bisphenol A synthesis - modeling of industrial reactor and catalyst deactivation

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Bisphenol A is an important starting material for production of epoxy resins and polycarbonates it is manufactured by ion exchanger resin catalyzed condensation of acetone and phenol. Much higher reaction rate is achieved when in the reaction environment are present mercapto-group containing compounds. Alternatively, the promoter can be either dissolved in the reaction mixture or immobilized in the resin catalyst. In Spolchemie factory in Ústí nad Labem is bisphenol A manufactured using the promoted ion exchanger catalyst. Important problem of this process is catalyst deactivation. In the contribution will be shown how analysis of the reactor operation and mathematical modeling of its behavior contributes to investigation of the deactivation nature and origin. There will be also discussed laboratory experiments allowing investigation of the deactivation process within acceptable time period and possibilities of a preventive action.