

### Effect of catalytic activity of carbon materials on catalytic hydrodechlorination of STC to TCS

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Carbon materials like lignite derived granular activated carbon (ACLG), wood derived activated charcoal (ACWP), multiwall carbon nanotubes (MWCNTs), carbon black (CbP), graphite (GpP) were used to investigate the catalytic activities on the hydrodechlorination of silicon tetrachloride (STC) to trichlorosilane (TCS). The carbon materials were treated with gaseous mixture of steam and nitrogen at 500oC for 2h and then labeled as ACLG-S500, ACWP-S500, MWCNT-S500, GpP-S500, and CbP-S500. The catalytic activities were tested with before and after steam treated carbon materials. The reaction was carried out in fluidized bed reactor at 700oC and atmospheric pressure and H<sub>2</sub>/STC molar-ratio of 4. ACLG, ACG-S500, MWCNT and ACWP, ACWP-S500 catalysts showed the high degree of conversion of STC to TCS in the range of 10 - 11.41%, while CbP, Cb-S500, GpP, GpP-S500 and MWCNT-S500 exhibited low conversion rate of 2 - 8.38%. The before-and-after-reaction catalysts were characterized in terms of their morphologies, structures, surface compositions, and functionalities.