

CATALYTIC REDUCTIVE AMINATION *p*-METHOXYBENZALDEHYDE WITH DI-*ISO*-PROPYLAMINE AT PRESENCE OF Co-CONTAINING COMPOSITE

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Reductive amination is important reaction widely applied for the preparation of different kinds of amines, which are important building blocks for medicinal chemistry. In such processes, carbonyl compounds react with amines at presence of a reducing agent and form corresponding amines. In particular, interaction of substituted benzaldehydes with branched aliphatic amines at presence of gaseous H₂ can lead to N-(*R*-benzyl)-N-dialkylamines. Common catalysts used for such reactions contain platinum group metals (PGM). Search of PGM-free catalysts for these transformations is important task of modern physical chemistry.

The aim of this study was to develop new PGM-free catalyst for reductive amination of *p*-methoxybenzaldehyde with di-*iso*-propylamine. The composite, containing Co metal and N-doped carboneous material, was chosen as promising candidate for this study.

The composite was prepared by pyrolysis Co(II) complex with imidazole deposited on aerosil (highly dispersed SiO₂). The composite contained only metallic Co as crystalline phase, as shown by powder XRD. It was found by transmission electronic microscopy that cobalt nanoparticles had the size of *ca.* 3–10 nm (Fig. 1a). Analysis of the Raman spectral data (Fig. 1b) allowed to conclude that the composite contained graphene-like carboneous species.

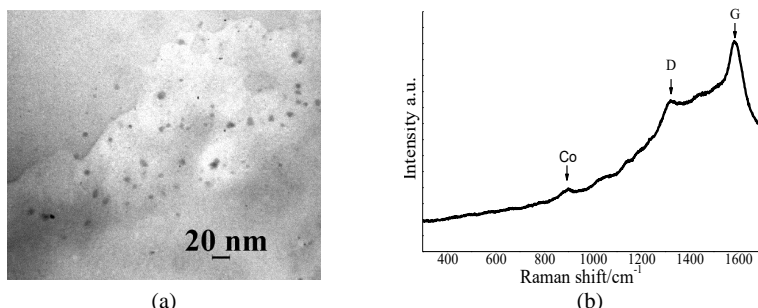


Fig. 1. TEM image of the Co/C/SiO₂ nanocomposite (a) and Raman spectra of the composites (b)

The catalytic activity of the obtained composite was tested in reaction of *p*-methoxybenzaldehyde with di-*iso*-propylamine under H₂ pressure (30 atm, 150 °C). The reaction products were analyzed by ¹H NMR and gas chromatography. It was found that the N-(*p*-methoxybenzyl)-N-di-*iso*-propylamine formed with *ca.* 88 % yield, while benzylic alcohol was the minor product.