

ABSTRACT

Provided is a method for preparing high-purity cobalt nitrate crystals from Co/SiO₂ waste catalysts. The method sequentially comprises the following steps: 1) calcining Co/SiO₂ waste catalysts to be treated at 350 to 500°C under the existence of air for 3 to 6 hours, grinding the Co/SiO₂ waste catalysts into powder after cooling to the room temperature; 2) transferring the waste catalyst powder into a fluidized bed reactor and taking reduction reaction for 8 to 12 hours in mixed gas of H₂ and N₂; 3) adding the waste catalysts after the reduction reaction into excessive dilute nitric acid solution to be fully dissolved and filtering; 4) using alkali liquid for regulating the pH value of the obtained cobalt nitrate solution to 1.5, adding oxalic acid solution for reaction in the water bath of 25 to 80°C, regulating the pH value of the reacted solution to 1.5 by diluted alkali solution and filtering the hot solution to obtain cobalt oxalate precipitates; 5) after drying the cobalt oxalate precipitates, roasting the dried cobalt oxalate precipitates at the temperature of 550 to 650°C for 4 to 8 hours; 6) dissolving the obtained cobalt oxide by dilute nitric acid solution and 7) evaporating and crystallizing the cobalt nitrate solution to obtain Co(NO₃)₂·6H₂O crystals. The recovery rate and the purity of the Co(NO₃)₂·6H₂O in the method are high.