

ABSTRACT

A method for recovering ruthenium from waste catalyst of aluminum oxide loaded with ruthenium comprises the following steps: drying, roasting and cooling the waste catalyst of aluminum oxide loaded with ruthenium; grinding into black powder containing ruthenium oxide; placing the black powder into a fluid bed reactor, introducing hydrogen and performing reduction reaction, thereby obtaining metal Ru; introducing a mixed gas of oxygen and ozone into the fluid bed reactor and oxidizing the waste catalyst, thereby obtaining RuO₄ gas; introducing the RuO₄ gas into sufficient hydrochloric solution to dissolve the RuO₄ gas, thereby obtaining an H₃RuCl₆ solution; adding excessive oxidant into the H₃RuCl₆ solution and promoting the H₃RuCl₆ to be fully oxidized, thereby generating hexachloro (IV) ruthenium acid; adding excessive NH₄Cl, reacting, filtering and cleaning filter cake, thereby obtaining an ammonium hexachloro (IV) ruthenium solid; and finally, performing hydrogen reduction treatment on the ammonium hexachloro (IV) ruthenium solid, thereby obtaining the metal ruthenium. The method is simple in operation, low in cost, short in recovering period and high in recovery ratio.