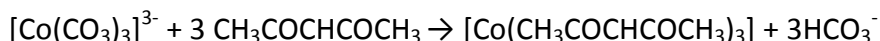
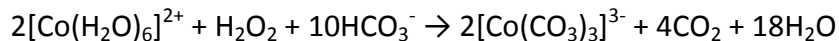


Tris(2,4-pentanedionato)cobalt(III)



To 4.8 g (20 mmol) of cobalt(II) chloride hexahydrate dissolved in 90 ml of water at room temperature is added 10 ml (~90 mmol) of 30% hydrogen peroxide. The resulting solution is poured – in small aliquots and while swirling vigorously – on 20 g of potassium hydrogen carbonate in a 500 ml conical flask. The dark green solution is left for 5 minutes while the excess of oxidizing agent disappears, because the solution itself catalyzes the disproportionation of hydrogen peroxide.

Next, 10 g (100 mmol) of pentanedione (acetylacetone) is added and the solution is heated until boiling while stirred gently. During the heating the compound precipitates as small green crystals. After cooling for 15 minutes, the product is separated by filtrating on a Büchner funnel. The crystals are thoroughly washed with water and finally with a little ethanol.

The isolated product is dried in the air and extracted with 50 ml of toluene by careful heating (avoid strong local heating). The hot extract is filtered using a folded filter in a conical funnel. After cooling the filtrate, around 150 ml of petrol ether (bp. 100-140 °C) is added in small aliquots over a period of 33-40 minutes. The crystals are isolated by filtration and washed with a little of the petrol ether and dried in the air on a watch glass.

Measure and calculate and report the yield in g and in % of the maximum amount possible assuming that you have a pure compound.

Measure and report the melting point of the dry product (expected 213 °C)

Record and report the absorption spectrum of a ca. 0.01 M solution in acetone in the interval $650 > \lambda > 450$ nm and downwards and calculate and report the data for observed and calculated (λ , ϵ) at maxima and minima. Enter acac⁻ in the spectrochemical series.