



>>Entry Name: Hexacarbonyldi-μ-chlorodichlorodiruthenium, 12Cl, 9Cl, 8Cl

Synonym(s): Hexacarbonyltetrachlorodiruthenium

CAS Registry Number: 22594-69-0

Extra CAS Registry Numbers(s): 22941-53-3

As Di-μ-bromodibromohexacarbonyldiruthenium, [FLM05-M](#) with
X = Cl

Molecular Formula: C₆Cl₄O₆Ru₂

Molecular Weight: 512.013

Accurate Mass: 511.653594

Percentage Composition: C 14.08%; Cl 27.70%; O 18.75%; Ru 39.48%

Source/Synthesis: Synth. by reaction of Ru₃(CO)₁₂ + Cl₂ in Et₂O, or by thermal dec. of Ru(CO)₄Cl₂, or by heating Ru₃(CO)₁₂ in CHCl₃

Use/Importance: Catalyst for hydrogenation, cyclodehydration of glycols, addn. of alkenes to formates, hydrogenation of benzylideneanilines, oxidn. of alcohols with Bu^tOOH and dehydrogenation of hydroxy esters → α-keto esters, cyanohydrins → α-keto nitriles

Physical Description: White solid; yellow when impure

Boiling Point: Subl._{0.003} 120°

Solubility: Sl. sol. CHCl₃; sol. MeOH, THF

Other Data: Turns orange-brown at 215°; dec. >315°. Chloride bridges readily cleaved by THF, PPh₃ etc.

Aldrich: 28814-4

>>Variant: α-form

Molecular Formula: C₆Cl₄O₆Ru₂

Molecular Weight: 512.013

Accurate Mass: 511.653594

Percentage Composition: C 14.08%; Cl 27.70%; O 18.75%; Ru 39.48%

>>Variant: β-form

Molecular Formula: C₆Cl₄O₆Ru₂

Molecular Weight: 512.013

Accurate Mass: 511.653594

Percentage Composition: C 14.08%; Cl 27.70%; O 18.75%; Ru 39.48%

>>Derivative: Trichlorostibine complex

CAS Registry Number: 79056-45-4

Molecular Formula: C₆Cl₇O₆Ru₂Sb

Molecular Weight: 740.121

Accurate Mass: 737.463971

Percentage Composition: C 9.74%; Cl 33.53%; O 12.97%; Ru 27.31%; Sb 16.45%

Physical Description: Pale yellow cryst. (CH₂Cl₂)

Other Data: Stable in dry air. Dec. by moisture

>>Derivative: THF complex

Use/Importance: Valuable synthetic intermed.

References:

Merlino, S. *et al.*, *Acta Cryst. B*, 1965, **24**, 424, (*struct*)

Bruce, M.I. *et al.*, *J.C.S.(A)*, 1967, 1238, (*synth, ir, use*)

Bruce, M.I., *Int. J. Mass Spectrom. Ion Phys.*, 1968, **1**, 141, (*ms*)

Cotton, J.D. *et al.*, *J.C.S.(A)*, 1968, 2162, (*synth, isom, ir*)

Benedetti, E. *et al.*, *J. Organomet. Chem.*, 1972, **37**, 361, (*ir*)

Inorg. Synth., 1976, **16**, 51, (*synth*)

Teulon, P. *et al.*, *J. Organomet. Chem.*, 1981, **214**, 391, (*struct, deriv*)

Tanaka, M. *et al.*, *Angew. Chem., Int. Ed.*, 1984, **23**, 518, (*use*)

Hayashi, T. *et al.*, *J. Mol. Catal.*, 1990, **58**, 165, (*use, catal*)

Remita, H. *et al.*, *Radiat. Phys. Chem.*, 1991, **37**, 221, (*radiolytic synth*)

Synthetic Methods of Organometallic and Inorganic Chemistry, (ed. Hermann, W.A.), Thieme, 1997, **7**, 43, (*synth, ir*)