>>**Entry Name: Cobalt samarium system**
Synonym(s): Samarium cobalt. Cobalt samarium. Samarium cobalt alloys

Molecular Formula: [CoSm]
General Statement: Several widely studied phases reported here
Other Data: Similar compds. formed with other lanthanides, but less industrial use

>>**Variant: Samarium compd. with cobalt (1:2)**
Synonym(s): Samarium cobalt ($SmCo_2$). Cobalt samarium (Co_2Sm)

CAS Registry Number: 12017-43-5
Molecular Formula: Co_2Sm
Molecular Weight: 268.226
Accurate Mass: 269.786125
Percentage Composition: Co 43.94%; Sm 56.06%
General Statement: $MgCu_2$ struct.

>>**Variant: Samarium compd. with cobalt (1:3)**
Synonym(s): Samarium cobalt ($SmCo_3$). Cobalt samarium (Co_3Sm)

CAS Registry Number: 12187-46-1
Molecular Formula: Co_3Sm
Molecular Weight: 327.16
Accurate Mass: 328.719323
Percentage Composition: Co 54.04%; Sm 45.96%

>>**Variant: Samarium compd. with cobalt (2:7),** 11Cl
Synonym(s): Samarium cobalt (Sm_2Co_7). Cobalt samarium (Co_7Sm_2)

CAS Registry Number: 12305-84-9
Molecular Formula: Co_7Sm_2
Molecular Weight: 713.252
Accurate Mass: 716.371844
Percentage Composition: Co 57.84%; Sm 42.16%
Use/Importance: Material for magnets; catalyst for dehydrogenation of organic compds. (e.g. MeOH, cyclohexene)
Physical Description: Metal
Aldrich: 33922-9

>>**Variant: Samarium compd. with cobalt (1:5),** 11Cl
Synonym(s): Vacomax. Samarium cobalt ($SmCo_5$). Cobalt samarium (Co_5Sm)

CAS Registry Number: 12017-68-4
Molecular Formula: Co_5Sm
Molecular Weight: 445.026
Accurate Mass: 446.585719
Percentage Composition: Co 66.21%; Sm 33.79%
General Statement: Most important Co-Sm compd.
Source/Synthesis: Synth by heating Sm_2O_3/Co/Ca in H_2 atm. at 1150° or by similar alternative reductions
Use/Importance: Widely investigated permanent magnet material ($Sm_{0.5}Pr_{0.5}Co_5$ similarly) with high coercivity. Absorbs H_2, catalyst for hydrogenation of org. compds. e.g. $PhNO_2$, $PhCOCH_3$, cyclohexane. Catalyses hydrogenation of CO to form hydrocarbons
Physical Description: Metal
Other Data: T_c 724°
Aldrich: 33921-0

>>**Variant: Samarium compd. with cobalt (2:17),** 11Cl
Synonym(s): Samarium cobalt (Sm_2Co_{17}). Cobalt samarium ($Co_{17}Sm_2$)

CAS Registry Number: 12052-78-7
Molecular Formula: $Co_{17}Sm_2$
Molecular Weight: 1302.584
Accurate Mass: 1305.703824
Percentage Composition: Co 76.91%; Sm 23.09%
General Statement: $TbCu_7$ struct.
Use/Importance: Dehydrogenates organic compds. Material for magnets
Physical Description: Metal
Melting Point: Mp 1375°
Other Data: Ferrimagnetic. T_c 440°. Exists in 3 cryst. forms; two are superstructures of high temp. disordered phase. (Th_2Zn_{17} struct.)