



>>Entry Name: Aluminium calcium oxide (Al₂CaO₄)

Synonym(s): CA. Calcium aluminate [Ca(AlO₂)₂]

CAS Registry Number: 12042-68-1

CaAl₂O₄

Molecular Formula: Al₂CaO₄

Molecular Weight: 158.039

Accurate Mass: 157.905329

Percentage Composition: Al 34.15%; Ca 25.36%; O 40.49%

Use/Importance: Used in ceramics and refractories and as support for transition metal and lanthanide phosphors.

Commercially available. Component of Portland cement

Physical Description: Microcryst. solid

Melting Point: Mp 1610°

Other Data: ΔH_f° -2326.3 kJ mol⁻¹ (298K); S° 114.2 J K⁻¹ mol⁻¹. Related compds. CaAl₁₂O₂₀, CaAl₄O₄, Ca₁₂Al₁₄O₃₃ also descr.

>>Derivative: Decahydrate

Synonym(s): CAH₁₀

CAS Registry Number: 12042-69-2

Extra CAS Registry Numbers(s): 39466-11-0

Other Data: Struct. comprises 2 rings of 6 edge-sharing [Al(OH)₆]³⁽⁻⁾ octahedra with Ca cations linking them together

References:

- Nurse, R.W. *et al.*, *Trans. Br. Ceram. Soc.*, 1965, **64**, 409, (phase diagram)
Tarte, P., *Spectrochim. Acta A*, 1967, **23**, 2127, (ir)
Rao, M.R. *et al.*, *J. Am. Ceram. Soc.*, 1968, **51**, 50, (phase diagram)
Palilla, F.C. *et al.*, *J. Electrochem. Soc.*, 1968, **115**, 642, (use)
Kor, G.J.W. *et al.*, *J. Iron Steel Inst., London*, 1968, **206**, 700, (phase diagram)
Brooksbank, D., *J. Iron Steel Inst., London*, 1968, **208**, 495, (thermal exp)
Oudalov, Y.P. *et al.*, *Mater. Res. Bull.*, 1969, **4**, 887, (synth)
Imlach, J.A. *et al.*, *Trans. Br. Ceram. Soc.*, 1973, **72**, 221, (system with FeO)
Hörkner, W. *et al.*, *J. Inorg. Nucl. Chem.*, 1976, **38**, 983, (cryst struct)
Allibert, M. *et al.*, *J. Am. Ceram. Soc.*, 1981, **64**, 307, (thermodyn)
Eliezer, I. *et al.*, *J. Phys. Chem.*, 1981, **85**, 2835, (thermodyn)
Müller, D. *et al.*, *J. Magn. Reson.*, 1984, **57**, 152, (Al-27 nmr)
Müller, D. *et al.*, *Polyhedron*, 1986, **5**, 779, (Al-27 nmr)
Richard, N. *et al.*, *Eur. J. Solid State Inorg. Chem.*, 1995, **32**, 649-660, (decahydrate, cryst struct)