



>>Entry Name: Iron carbides

Related CAS Registry Numbers(s): 12173-11-4

Molecular Formula: [CFe]

>>Variant: Iron carbide (Fe₃C)

CAS Registry Number: 12011-67-5

Molecular Formula: CFe₃

Molecular Weight: 179.552

Accurate Mass: 179.804817

Percentage Composition: C 6.69%; Fe 93.31%

Physical Description: Dark grey air-sensitive powder

Melting Point: Mp 1250°

>>Derivative: Hexagonal-form

Synonym(s): Cementite

CAS Registry Number: 12169-32-3

Molecular Formula: CFe₃

Molecular Weight: 179.552

Accurate Mass: 179.804817

Percentage Composition: C 6.69%; Fe 93.31%

Use/Importance: Constituent of steel

Physical Description: Grey, cubic; pleated hexagonal array of Fe atoms; C in distorted trigonal prismatic sites

Melting Point: Mp 1837°

Other Data: Dec. by dil. acid to form hydrocarbons. Curie point 210-215°; hard and brittle

>>Derivative: Mineral-form

Synonym(s): Cohenite

CAS Registry Number: 61027-57-4

Molecular Formula: CFe₃

Molecular Weight: 179.552

Accurate Mass: 179.804817

Percentage Composition: C 6.69%; Fe 93.31%

Source/Synthesis: Mineral, found in meteorites, volcanic rocks

>>Derivative: Solid soln.

Synonym(s): Austenite

CAS Registry Number: 12244-31-4

Source/Synthesis: Formed >906° in smelting process; obt. by rapid quenching

Use/Importance: Component of steel

Physical Description: Solid soln. of C in γ-Fe; C atoms arranged at random and in octahedral sites; (γ-Fe is fcc)

Other Data: Non-magnetic; adding Mn and Ni allows formation at lower temps. than when pure

>>Derivative: Solid soln.

Synonym(s): Martensite

CAS Registry Number: 12173-93-2

Source/Synthesis: Obt. by quenching austenite below 150°

Use/Importance: V. hard brittle steel (a characteristic property of quenched steels). Main use as a constit. of hardened carbon steel tools

Physical Description: A supersaturated solid soln. of C in α-Fe (bcc)

Other Data: Contains ≤1.6% C

>>Derivative: Solid soln.

Synonym(s): Sorbite, 9C1

CAS Registry Number: 53469-19-5

Source/Synthesis: Formed by tempering martensite

Use/Importance: Tougher steel than one formed by quenching

Physical Description: A mixt. of cementite (Fe₃C) and ferrite