

Metallic magnesium and pure magnesium oxide are produced by carbothermal reduction of starting materials such as magnesium oxide containing minor amounts of oxides of Fe, Si, Ca and Al, and/or magnesium silicate minerals, such as olivine, at subatmospheric pressure. Metallic magnesium is evaporated from a reduction zone and pure metallic magnesium and pure magnesium oxide are precipitated in a second condensation zone. Si is partly evaporated as SiO which is precipitated in a first condensation zone upstream the second condensation zone, partly converted to SiO and an alloy of Si and Fe in the reaction mixture. The starting materials may also be processed by a method wherein their magnesium component is converted to magnesium oxide in the reaction mixture, while the remaining components are converted to SiO and an alloy of Si and Fe. Au and valuable siderophilic elements may be recovered by leaching the alloy of Si and Fe.

