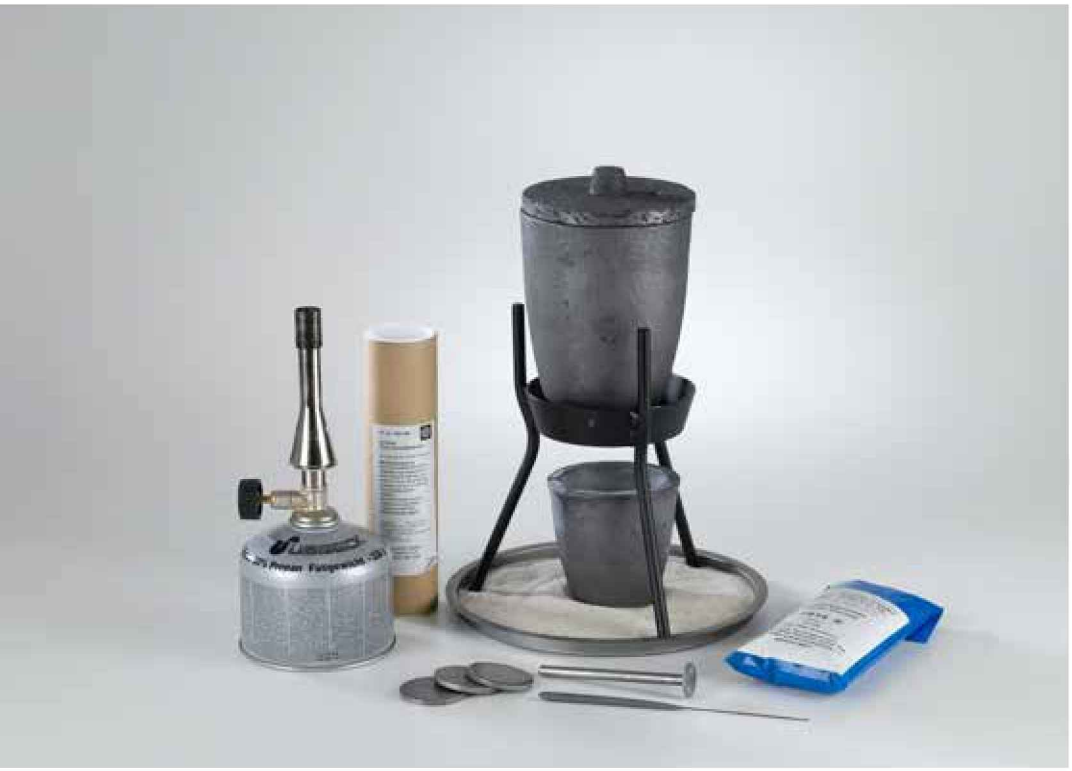

C5.1.2
EXTRACTION OF METALS FROM ORE

C5.1.2.2
The thermite process

The thermite process (C5.1.2.2)

Cat. No.	Description	C5.1.2.2
661 540	Thermite experiment	1
675 0440	Thermite igniting sticks	1
666 714	Cartridge burner, DIN type	1
666 731	Gas igniter, mechanical	1
667 035	Crucible tongs 200 mm	1
604 222	Measuring scoop, PP, 50 ml	1
510 15	Magnet with bore	1
667 104	Cover plate, 50 cm x 50 cm	1*
667 614	Heat protective gloves	1*
	additionally required: hammer, aluminium foil	1

* additionally recommended

Experiment C5.1.2.2 demonstrates the principle of the thermite process. In engineering, the thermite process is used to weld railway tracks together. A mixture of aluminium grit and iron(II, III) oxide is added to the apparatus and lit with an ignition rod. Liquid iron and aluminium oxide form in a very exothermic reaction. The iron has a higher density than aluminium oxide and so it sinks down in the melt.

$$Fe_2O_3 + 2\,Al \rightarrow 2\,Fe + Al_2O_3$$

Because aluminium releases immense quantities of energy in the reaction with oxygen, the reaction needs only to be started with an igniter. The energy released drives the rest of the process, and along with that it also liquefies the resulting iron.