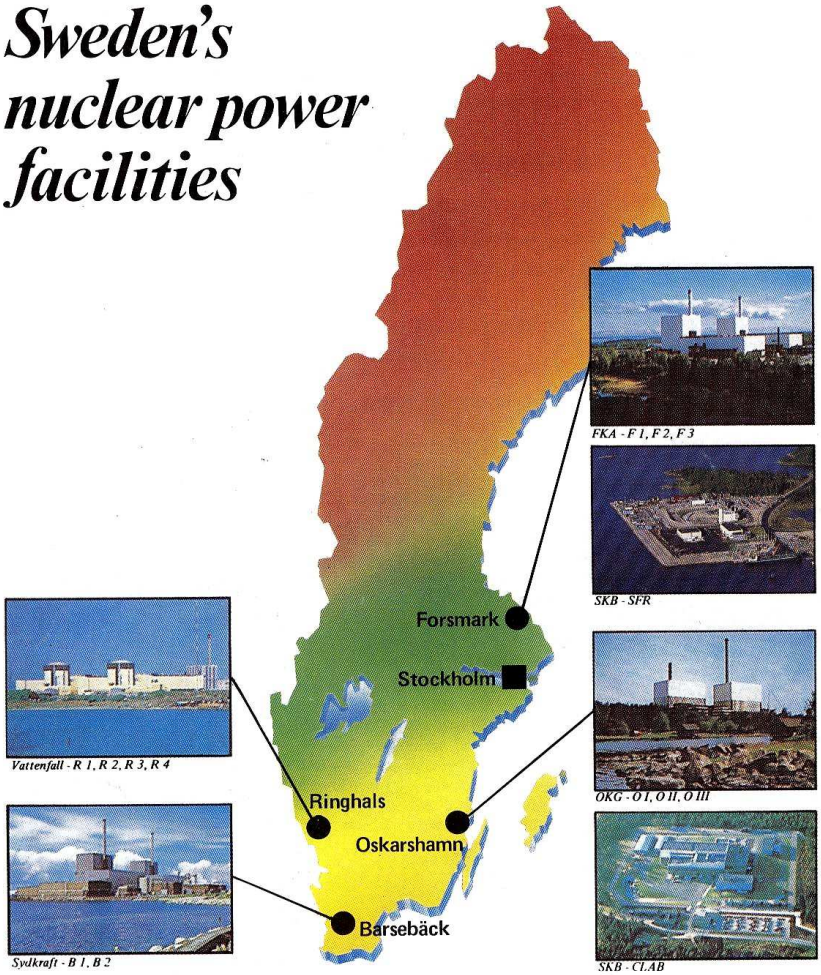
Sweden's nuclear power facilities

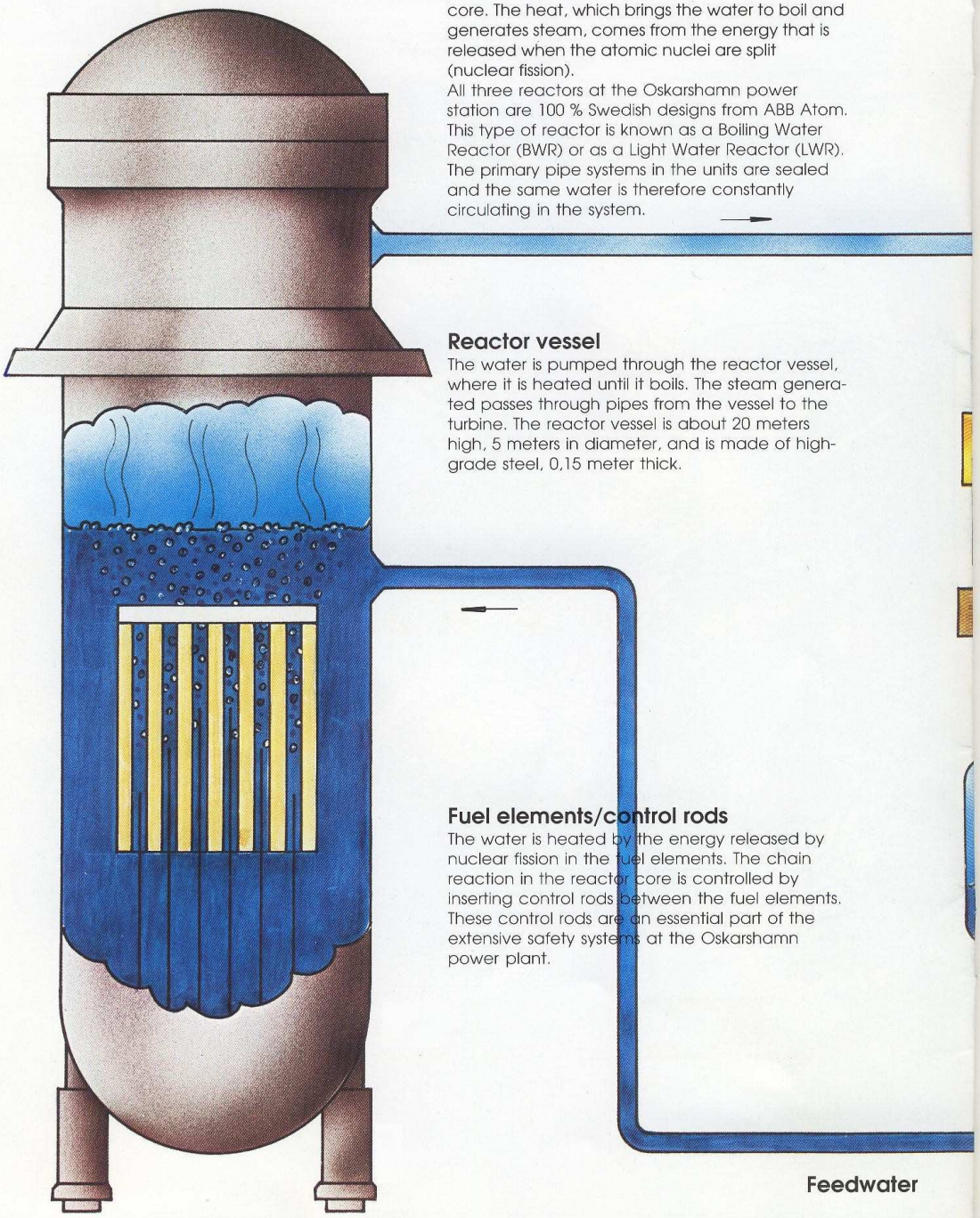


SKB
SWEDISH NUCLEAR FUEL AND WASTE MANAGEMENT COMPANY
Box 5864 S-102 48 STOCKHOLM
SWEDEN
Phone: Int. +46 8 665 28 00

Fem Konsulter AB/Kindbergs Tryckeri AB/C003 E 818 025

How We Generate Electricity

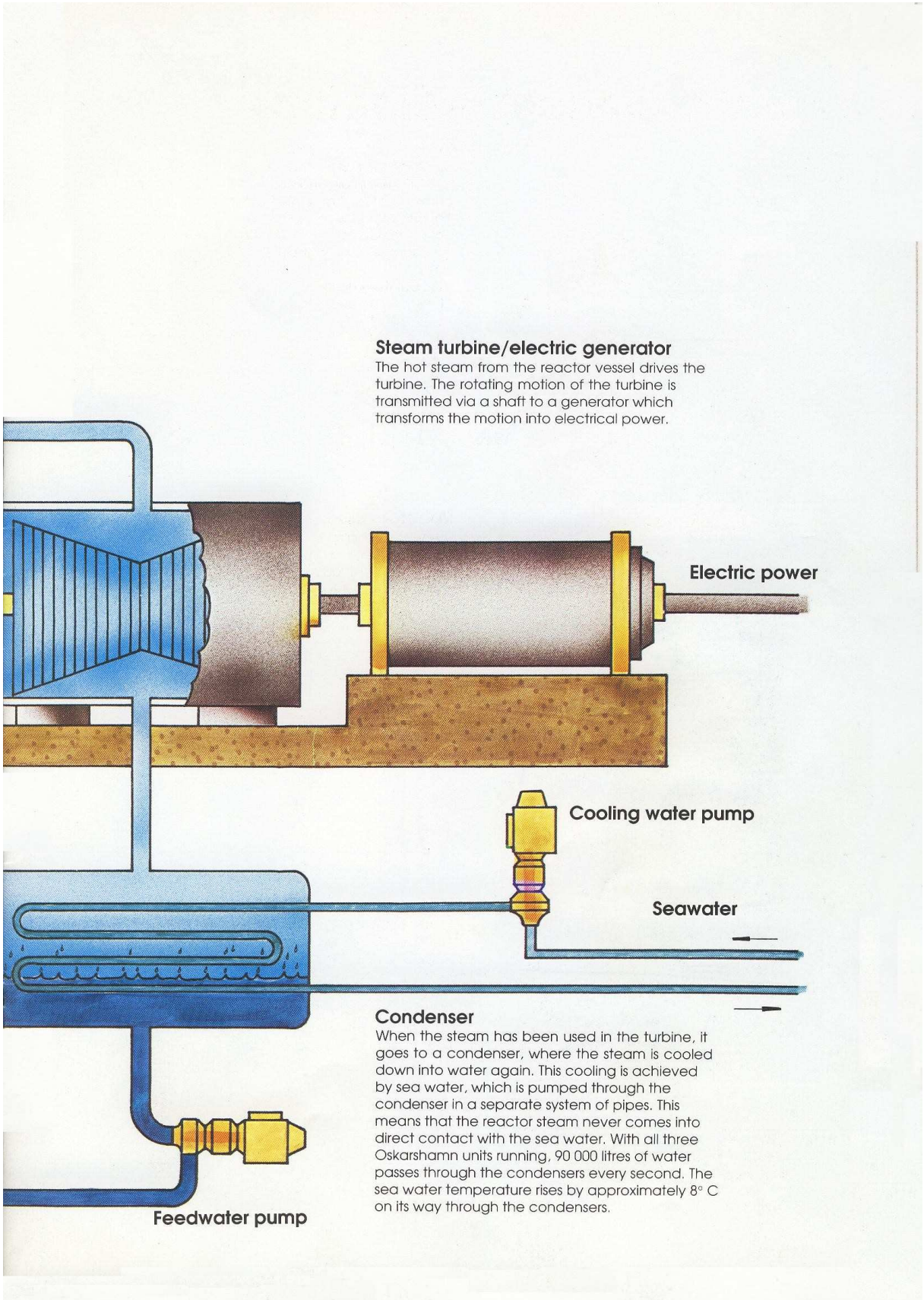
Like an oil-fired or a coal-fired power unit, a nuclear power unit produces steam which actuate the turbines. In oil- and coal-fired units, the heat comes from burning oil or coal. In a nuclear power station, heat is generated in the reactor core. The heat, which brings the water to boil and generates steam, comes from the energy that is released when the atomic nuclei are split (nuclear fission).
All three reactors at the Oskarshamn power station are 100 % Swedish designs from ABB Atom. This type of reactor is known as a Boiling Water Reactor (BWR) or as a Light Water Reactor (LWR). The primary pipe systems in the units are sealed and the same water is therefore constantly circulating in the system.



Reactor vessel
The water is pumped through the reactor vessel, where it is heated until it boils. The steam generated passes through pipes from the vessel to the turbine. The reactor vessel is about 20 meters high, 5 meters in diameter, and is made of high-grade steel, 0,15 meter thick.

Fuel elements/control rods
The water is heated by the energy released by nuclear fission in the fuel elements. The chain reaction in the reactor core is controlled by inserting control rods between the fuel elements. These control rods are an essential part of the extensive safety systems at the Oskarshamn power plant.

Feedwater

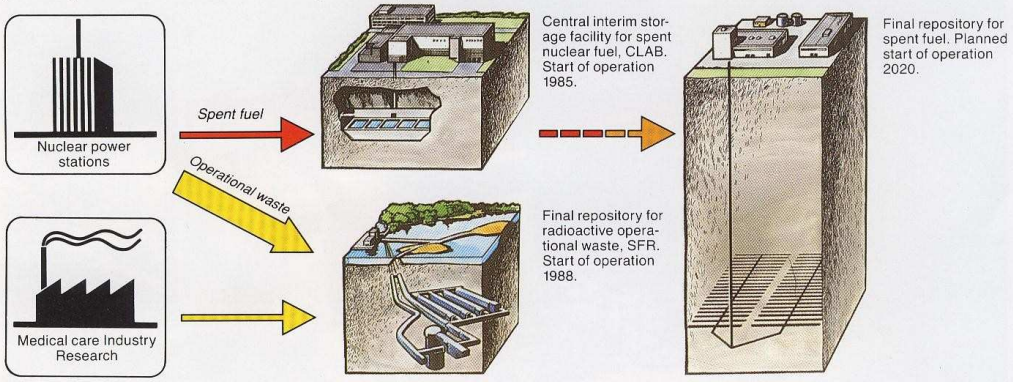

Steam turbine/electric generator
The hot steam from the reactor vessel drives the turbine. The rotating motion of the turbine is transmitted via a shaft to a generator which transforms the motion into electrical power.
Electric power
Cooling water pump
Seawater
Condenser
When the steam has been used in the turbine, it goes to a condenser, where the steam is cooled down into water again. This cooling is achieved by sea water, which is pumped through the condenser in a separate system of pipes. This means that the reactor steam never comes into direct contact with the sea water. With all three Oskarshamn units running, 90 000 litres of water passes through the condensers every second. The sea water temperature rises by approximately 8° C on its way through the condensers.
Feedwater pump

Radioactive waste

Svensk Kärnbränslehantering AB, SKB (the Swedish Nuclear Fuel and Waste Management Company), is responsible for ensuring that Sweden's radioactive waste from nuclear power, medical care, industry and research is disposed of in a safe manner.

Today SKB has a transportation system, a final repository for radioactive operational waste (where decommissioning waste from the nuclear power plants can also eventually be disposed of) and an interim storage facility for spent nuclear fuel. What remains to be built is a final repository for the fuel.

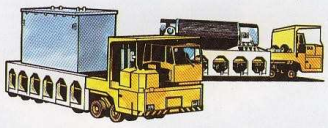
After 40 years of interim storage, the radioactivity and heat output of the spent fuel will have declined by 90%. It will then be ready for final disposal. This can be accomplished by encapsulating the fuel in copper canisters and embedding them in clay 500 metres down in the crystalline bedrock.



The transportation system

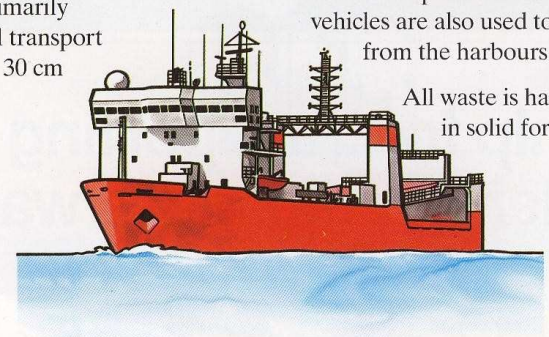
All Swedish nuclear power stations, as well as the waste management facilities, are situated on the coast. The waste can therefore easily be transported by sea on the specially-built ship M/S Sigyn. The ship plies the Swedish coast and carries only Swedish waste.

M/S Sigyn meets very high safety standards. However, safety is primarily guaranteed by special transport containers with up to 30 cm thick steel walls.

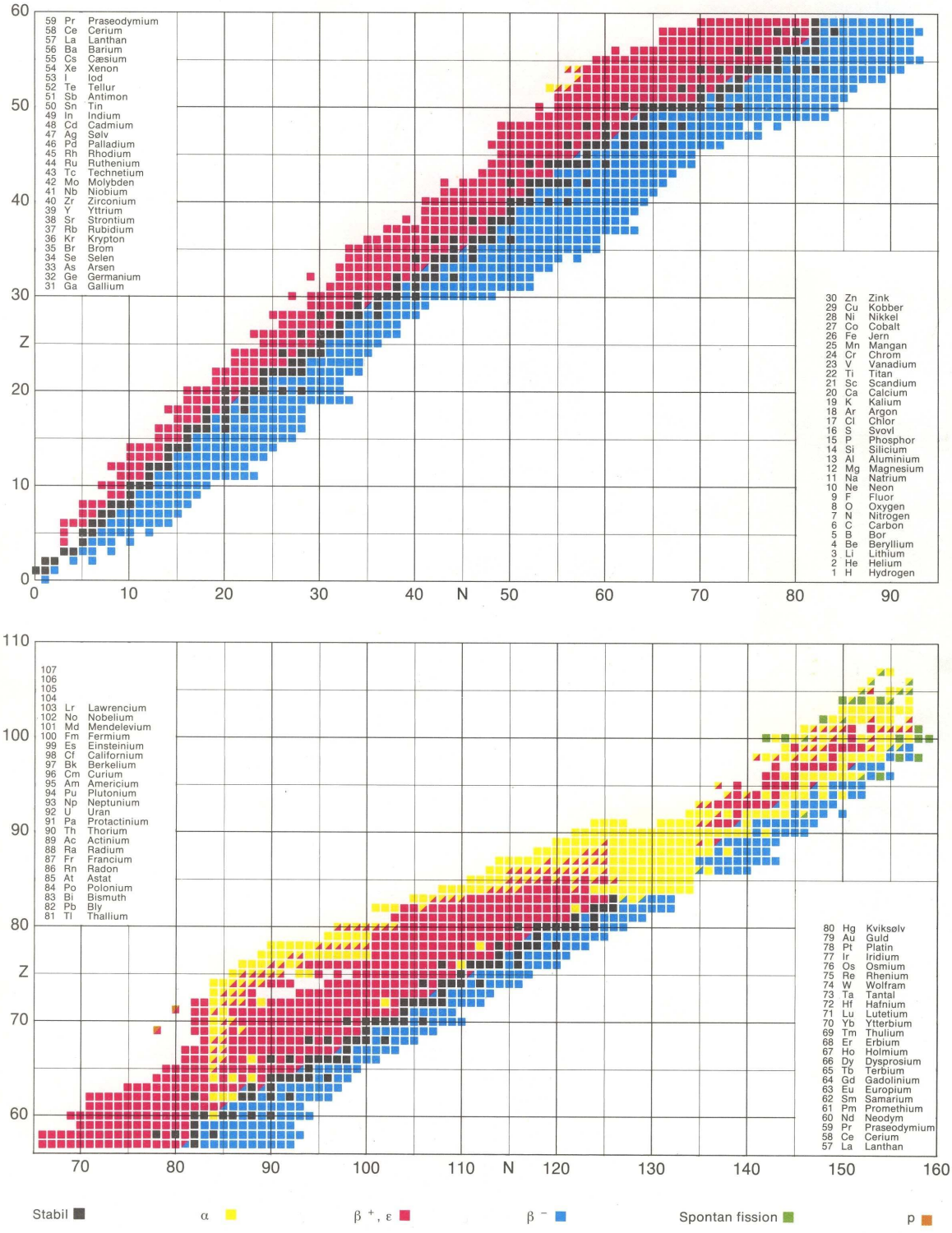


The transport containers weigh between 80 and 120 tonnes and are loaded and unloaded with the aid of special terminal vehicles. These vehicles are also used to transport waste to and from the harbours.

All waste is handled and transported in solid form.



KERNEKORT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58 Ce Cerium
57 La Lanthan
56 Ba Barium
55 Cs Cæsium
54 Xe Xenon
53 I Iod
52 Te Tellur
51 Sb Antimon
50 Sn Tin
49 In Indium
48 Cd Cadmium
47 Ag Sølv
46 Pd Palladium
45 Rh Rhodium
44 Ru Ruthenium
43 Tc Technetium
42 Mo Molybden
41 Nb Niobium
40 Zr Zirconium
39 Y Yttrium
38 Sr Strontium
37 Rb Rubidium
36 Kr Krypton
35 Br Brom
34 Se Selen
33 As Arsen
32 Ge Germanium
31 Ga Gallium
30 Zn Zink
29 Cu Kobber
28 Ni Nikkel
27 Co Cobalt
26 Fe Jern
25 Mn Mangan
24 Cr Chrom
23 V Vanadium
22 Ti Titan
21 Sc Scandium
20 Ca Calcium
19 K Kalium
18 Ar Argon
17 Cl Chlor
16 S Svovl
15 P Phosphor
14 Si Silicium
13 Al Aluminium
12 Mg Magnesium
11 Na Natrium
10 Ne Neon
9 F Fluor
8 O Oxygen
7 N Nitrogen
6 C Carbon
5 B Bor
4 Be Beryllium
3 Li Lithium
2 He Helium
1 H Hydrogen
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106
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103 Lr Lawrencium
102 No Nobelium
101 Md Mendelevium
100 Fm Fermium
99 Es Einsteinium
98 Cf Californium
97 Bk Berkelium
96 Cm Curium
95 Am Americium
94 Pu Plutonium
93 Np Neptunium
92 U Uran
91 Pa Protactinium
90 Th Thorium
89 Ac Actinium
88 Ra Radium
87 Fr Francium
86 Rn Radon
85 At Astat
84 Po Polonium
83 Bi Bismuth
82 Pb Bly
81 Tl Thallium
80 Hg Kviksølv
79 Au Guld
78 Pt Platin
77 Ir Iridium
76 Os Osmium
75 Re Rhenium
74 W Wolfram
73 Ta Tantal
72 Hf Hafnium
71 Lu Lutetium
70 Yb Ytterbium
69 Tm Thulium
68 Er Erbium
67 Ho Holmium
66 Dy Dysprosium
65 Tb Terbium
64 Gd Gadolinium
63 Eu Europium
62 Sm Samarium
61 Pm Promethium
60 Nd Neodym
59 Pr Praseodymium
58 Ce Cerium
57 La Lanthan
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70 80 90 100 110 120 130 140 150 160
Stabil
α
β +, ε
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Spontan fission
p