

How large are world uranium deposits?

Date : July 7, 2017



The average naturally occurring concentration of uranium in the Earth's crust is quite high – $3 \times 10^{-4}\%$. This is more than, for instance, silver (30 times less), or gold (1,000 times less). A high content of uranium is present, for example, in granites – 25 grams per tonne as well as in seawater – about 3.4 $\mu\text{g/l}$. The relatively thin 20-kilometre upper layer of the Earth's surface contains about 1,014 tonnes of uranium. However, uranium belongs to the group of trace elements meaning that only a small part of it is present in ore fields with a concentration higher than 0.3%. Nevertheless, historically uranium was produced from very rich fields. Thus, uraninite from Congo (now Republic of Zaire), used for the production of nuclear weapons in the USA, had 65% (of the total weight) of pure uranium dioxide. Nowadays we can only dream of such levels and ore fields with a concentration higher than 0.3% are considered as rich. Ore with lower concentration is considered as lean. Presently it is deemed economically viable to mine uranium ore if the concentration of uranium is within the range from 0.001% up to 0.5%. At the same time economic viability depends to a great extent on the target product, whether uranium is the main and only target of mining or a by-product obtained during comprehensive ore treatment (e.g. extracting phosphates, gold,

molybdenum, vanadium and rare earth elements).