

Uranium provinces and their significance in term of uranium exploration

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The global distribution of U deposits on the Earth shows that some specific domains present a high endowment, whereas others do not present any known resource (1). The origin, evolution, nature, and distribution of U provinces, and the specificities of some of the main ones will be discussed. The delineation of U provinces is of crucial importance for the definition of U exploration strategies and the estimation of potential U resources in such domains.

The necessity of a metal enrichment in the source for the formation of an ore deposit is debated. The term "metallogenic province" was initially defined, as an area on Earth with numerous mineral deposits of a specific metal or type (e.g. Cu province of the South American Cordillera). But, the concept of metallogenic provinces has evolved and the definition has been extended to existence of previous metal enrichment in the Earth's mantle or crust, leading to the concept of metal domain, or regional geochemical specialization. Conversely, other authors propose that for metals with crustal abundances above 10 ppm, no pre-enrichment of the crust is required to generate a deposit. Its formation would be controlled by the availability of a sufficient amount of fluids able to dissolve and transport the metal and then to concentrate it through an efficient trapping mechanism.

Numerous U provinces exist in the world but the successive U enrichment steps within them are not always well identified and their geographic extension is not always accurately defined. The history of some provinces starts as early as the Archean, whereas others are young. Inserted maps of some of the main provinces are provided in the IAEA World Uranium Map (1).

1. INTERNATIONAL ATOMIC ENERGY AGENCY, World Distribution of Uranium Deposits Second Edition, Map, IAEA, Vienna (2018).

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