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Validation of the method for Ni determination in NPP evaporator concentrates

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In this work a procedure developed for direct determination of radionickel in boric acid containg evaporator concentrate generated at VVER nuclear power plants has been validated for repeatability. For nickel separation, this method uses the composite material PAN-DMG (dimethylglyoxime incorporated in porous beads of polyacrylonitrile) to selectively bind 59+63Ni from the above mentioned concentrate. The PAN-DMG resin has been prepared by methods developed at our Department of nuclear chemistry at the Czech Technical University in Prague [1]. The method of 59,63Ni separation on column filled with PAN-DMG from real boric acid concentrates, that was validated in this work, has been developed in the thesis of Fišera [2]. In this work the influence of different uncertainty sources on the repeatability of this method has been studied. The repeatabilities of nickel separation, sample preparation, sample measurement, was investigated in this work. In addition, influence of the type of scintillation cocktails used on the measurement was determined. The results obtained showed that as well as whole method also the particular parts of the methods are repeatable.
[1] F. Sebesta, Composite inorganic exchangers of metal ions based on polyacrylonitrile and their use, Thesis of habilitation (1997) FNSPE, CTU in Prague
[2] O. Fišera and F. Šebesta, 59Ni and 63Ni separation from boric acid concentrates produced at NPP, J.Radioanal. Nucl. Chem. (2010) 285: 519-523

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