

Importance of Analyte-matrix Separation in U-Pb and Pb-Pb Dating Systems

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Dating is nowadays widely used analytical approach combining geology and analytical chemistry. It provides useful geochronological information in specific areas. Inductively coupled plasma mass spectrometry (ICP-MS) is still one of the common methods used for elemental and isotope ratios analysis [1]. The dating principle assumes that the age of a sample can be calculated from the ratio of two or more isotopes present in the sample. To determine the isotope ratios, sample preparation is crucial in order to eliminate interferences and improve accuracy and precision [2].

Besides ore mining, manual separation, sample digestion and dissolution, the critical step in the preparation procedure is analyte-matrix separation. Uranium and lead are usually separated from sample matrix by the principles of ion exchange chromatography using previously developed procedures [3, 4] or new approaches can be introduced. In this study, series of U and Pb standard solutions were used to optimize the separation procedure using commercially available resins. Different eluting agents were tested. After the method optimization, uraninite samples were analysed. For both elemental and isotopic analysis, solution method ICP-MS was used.

Key words: ICP-MS, uranium-lead dating system, ion exchange chromatography, dating

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