

ABSTRACT

At the present time using modern, highly sensitive instruments, geochemical study of carbonates can provide a great deal of information on the properties of the marine environment at the time of its formation. Mass spectrometry is an important method for the determination of trace elements in fossil organisms. Problems are encountered in analysis of low contents in relation to calibration of instruments, finding suitable standards and, last but not least, the difficult paleo-environmental interpretation of the data obtained. This work is concerned with comparison of the ICP-MS (inductively coupled plasma – mass spectrometry) analytical methods and analysis of a solution using ICP-MS for materials with extremely high calcium content. The methods were tested on standards and then applied to real samples. The LA ICP-MS (laser ablation inductively coupled plasma – mass spectrometry) method was found to be preferable in relation to the purpose of the measurement and possible imprecisions in sample preparation. To obtain better results by solution analysis, it was proposed that the samples would be prepared by multi-step mineralization ($\text{HNO}_3 / \text{HF} + \text{HClO}_4$). From the standpoint of paleo-environmental interpretation, the data measured in the growth zones of *Actinostroma clathratum* stromatoporoid provide a record that represents three different climatic systems.