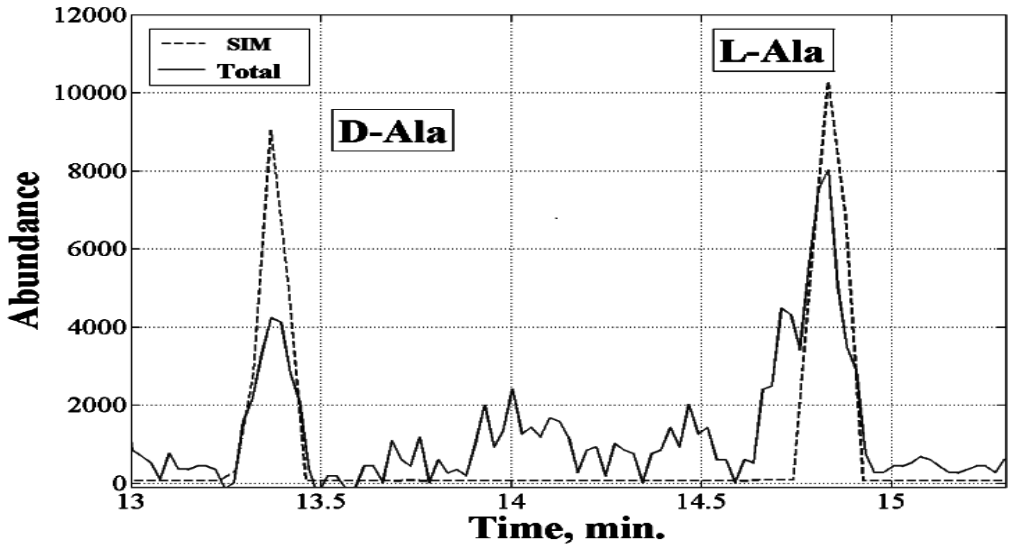
Symmentry breaking of alanine synthesized in a plasma torch generated by a hypervelocity meteorite impact reproduced in the laboratory. George G. Managadze[1], Michael H. Engel[2], Stephanie Getty[3], Peter Wurz[4], William B. Brinckerhoff [3], Anatoly G. Shokolov[5], Gennady V. Sholin[6], Sergey A. Terent'ev[7], Alexander E. Chumikov[1], Alexander S. Skalkin[5], Vladimir D. Blank[7], Vyacheslav M. Prokhorov[7] and Nina G. Managadze[1], [1] Space Research Institute, Profsoyuznaya st. 84/32, Moscow, 117997 Russia, [2] School of Geology & Geophysics, The University of Oklahoma, Norman, OK 73019, USA, [3] NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA, [4]Physics Institute, University of Bern, 3012 Bern, Switzerland, [5] Central Research Institute of Machine Building, Moscow, Russia, [6] NRC "Kurchatov Institute", Moscow, Russia, [7] Technological Institute for Super hard and Novel Carbon Materials, Moscow, Russia.

We present a laboratory reproduction of hypervelocity impacts of a carbon containing meteorite on a mineral substance representative of planetary surfaces. The properties of the impact plasma torch provide conditions for abiogenic synthesis of protein amino acids: We identified glycine and alanine, and in smaller quantities serine, in the produced material. Moreover, we observe breaking of alanine mirror symmetry with L excess, which coincides with the bioorganic world. Therefore the selection of L-amino acids for the formation of proteins for living matter was not random, but was defined by the plasma processes occurring in the impact torch. This indicates that the plasma torch from meteorite impacts could play an important role in the formation of bio molecular homochirality. Thus, meteorite impacts possibly were the initial stage of this process and promoted conditions for the emergence of a living matter.



Section of the total ion chromatogram of amino acids (N-trifluoroacetyl, isopropyl esters) extracted from the impact sample, with the retention times for D-Ala and L-Ala at 13.3 s and 14.7 s, respectively, derived from SIM mode. Comparison of chromatograms in SIM mode and total ion mode to verify the retention times for D-Ala and L-Ala. In SIM mode the mass 140 amu was used for D-Ala and L-Ala.