

## Abstract

The thesis is a contribution to research aimed at modeling the conditions of the Big Bang and monitoring possible reaction products. As the starting compounds were selected 2-amino-1-butanol, 3-methoxy-1-propanol, 2-methyl-1-butanol, formamide, some of which were subsequently bombarded by PALS at J. Heyrovsky Institute of Physics, Academy of Sciences. Gas chromatography hyphenated with mass spectrometry and liquid chromatography with UV detection were used for analysis. In GC-MS, calibration of 3-methoxy-1-propanol and 2-methyl-1-butanol was carried out and LOD and LOQ were calculated. Comparison of 3-methoxy-1-propanol and bombarded 3-methoxy-1-propanol did not show the emergence of new products since 3-methoxy-1-propanol was in excess. The found compounds can be more likely identified as impurities present in a solvent or in the individual standards. The optimized HPLC system has managed to separate the three standards. Formamide, which is unsuitable for analysis by gas chromatography, due to its high polarity, however, eluted in all tested systems with system peak (the dead time marker). Nevertheless, the bombarded sample was analyzed for comparison with the original standard. Comparison, however, showed no reaction products in the bombarded sample.

### Key words:

big bang

laser sparks

formamide

2-amino-1-butanol

3-methoxy-1-propanol

2-methyl-1-butanol

gas chromatography

high performance liquid chromatography