OS-12. Analytical results of commercially available hydrogen supplements

[Background & Objectives]

Some commercially available hydrogen supplements may contain a hydrogen-generating substance unlisted in their components. To clarify this, the components of hydrogen supplements (three products available on the Internet) were analyzed, demonstrating formulated hydrogenated compounds (hydrogenated magnesium, sodium borohydride, and potassium borohydride). In the present study, we report the analytical results and concerns about ingesting hydrogenated compounds.

[Materials & Methods]

Each hydrogen supplement was pulverized in an agate mortar and then analyzed for hydrogen-generating substances by X-ray diffraction (XRD) using a wide angle X-ray diffractometer (Rigaku Corporation, RINT-TTR III type). The diffraction was carried out in the Inorganic Structure Analysis Laboratory of the UBE Scientific Analysis Laboratory, Inc. Of the products, one was also subjected to NMR analysis (nuclide: 11B, device: JNX-ECX 400) at JEOL RESONANCE Co., Ltd.

[Results]

The three hydrogen supplements were subjected to component analysis (XRD measurement). As a result, hydrogenated magnesium and potassium borohydride, unlisted on the product package, were identified in two products. Also in the remaining one product, hydrogenated compounds (hydrogenated magnesium, sodium borohydride, and potassium borohydride), unlisted on the product package, seemed to be contained. Hydrogen supplements in which no hydride was identified by XRD measurement were subjected to NMR analysis, suggesting that the hydrogen-generating substance is a tetracoordinate compound, with boron and hydrogen nuclei present in the same

molecule.

[Discussion]

The hydrogen-generating substances identified by the analysis may conflict with laws and ordinances, because they are not approved as food additives by the Ministry of Health, Labor and Welfare. The hydrogenated compounds eliminated the blue dye of “methylene blue,” which cannot be eliminated with only hydrogen molecules, suggesting the generation of substances, such as atomic hydrogens and hydride ions, with high reactivity markedly different from that of molecular hydrogens. Thus, some hydrogen supplements available on the Internet may conflict with laws and ordinances.