1,3-Butadiene (BD) is a Class 1 carcinogen present at workplaces, in polluted air, in automobile exhaust, and in tobacco smoke. 2-Hydroxybutene-1-yl mercapturic acid (2-MHBMA) is a urinary metabolite often measured as a biomarker for exposure to BD. Here, we show for the first time that an additional MHBMA isomer is present at significant amounts in human urine, 1-hydroxybutene-2-yl mercapturic acid (1-MHBMA). For its quantification, a highly sensitive UPLC-HILIC-MS/MS method was developed and validated. Analyzing urinary samples of 183 volunteers, we demonstrate that 1-MHBMA is a novel and potentially more reliable biomarker for BD exposure than the commonly analyzed 2-MHBMA.
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