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Infrared Laser-Induced Breakdown Spectroscopy of Alkali Metal Halides EI BROWN, UWE HOMMERICH, Hampton University, CLAYTON YANG, Battelle Eastern Science and Technology Center, SUDHIR TRIVEDI, Brimrose Corporation of America, ALAN SAMUELS, PETER SNYDER, Edgewood Chemical Biological Center — Laser-induced breakdown spectroscopy (LIBS) is a powerful diagnostic tool for detection of trace elements by monitoring the atomic and ionic emission from laser-induced plasmas. LIBS is a relatively simple technique and has been successfully employed in applications such as environmental monitoring, materials analysis, medical diagnostics, industrial process control, and homeland security. Most LIBS applications are limited to emission features in the ultraviolet-visible-near infrared (UV-VIS-NIR) region arising from atoms and simple molecular fragments. In the present work, we report on the observation of mid-infrared emission lines from alkali metal halides due to laser-induced breakdown processes. The studied alkali metal halides included LiCl, NaCl, NaBr, KCl, KBr, KF, RbCl, and RbBr. The laser-induced plasma was produced by focusing a 16 mJ pulsed Nd:YAG laser (1064 nm) on the target. The LIBS infrared emission from alkali halides showed intense and narrow bands located in the region from 2-8 μm . The observed emission features were assigned to atomic transitions between higher-lying Rydberg states of neutral alkali atoms. More detailed results of the performed IR LIBS studies on alkali metal halides will be discussed at the conference.

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