SUBMILLIMETER-WAVE SPECTROSCOPY OF NEGATIVE IONS : SH^-, SD^-

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For the first time submillimeter-wave transitions of an anion have been firmly identified. One transition of SH^- ($J = 0 - 1$, 564421.869 MHz) and two of SD^- ($J = 0 - 1$, 292359.129 MHz ; $J = 1 - 2$, 584629.519 MHz) have been observed. The negative ions were created in the positive column of an electric discharge in a mixture of H_2S and argon. By studying the Doppler shift brought about the anion by the motion of the charged species in the electric field of the discharge, we were able to distinguish between positively and negatively charged ions and neutral.