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An Attempt to Determine Molybdenum by Atomic Absorption Spectrophotometry

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AN ATTEMPT TO DETERMINE MOLYBDENUM BY ATOMIC ABSORPTION SPECTROPHOTOMETRY

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An attempt was made to work out a method for routinely determining molybdenum by atomic absorption spectrophotometry. A stock standard was prepared containing 1000 ppm molybdenum as Mo_4^{--}. Sensitivity of the spectrophotometer was found to be zero for aqueous solutions in the 1-10 ppm range. A pH-dependence study of extraction of the molybdate with DDC and MIBK gave best results at about pH 4 (graph attached).

Attempts to analyze a mud sample yielded extremely poor results. The dried mud was treated with a 4:1 mixture of hydrochloric and nitric acids. Addition of DDC to the filtered solution produced a large quantity of black sediment, which extracted into the MIBK. The extract gave an absorbance of greater than 100%, as compared with 14.7% for a similarly extracted standard solution of 100 ppm. The excessively high reading may be due to interference by particulate matter in the extract.

Throughout the work, considerable difficulty was caused by low sensitivity of the spectrophotometer and inconsistent sensitivity in individual runs. David[1] reports that absorption by molybdenum is depressed by the presence of Ca, Sr, Mn, Fe, and SO_4^{--}, and is somewhat affected by HNO_3, and also that the sensitivity goes to zero in an oxidizing flame.

A bibliography is included which may be useful to further studies.

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pH dependence of extraction, using 25 ml of a 30 ppm solution, 5 ml DDC, 5 ml MIBK.

pH	% abs
2	34.9
3	35.6
4	37.1
5	27.6
6	17.9
7	11.2
8	19.6