

Waters

Lab Highlights

ION SPECIATION ANALYSIS USING LC: Cu^{+1} FROM Cu^{+2}

Many researchers have been interested in the development of paired-ion, reversed-phase LC separations for the analysis of cations and anions since these approaches utilize conventional LC's. Dr. I. Krull at Northeastern has been successful in speciating cuprous (Cu^{+1}) and cupric (Cu^{+2}) from an "old" sample of cuprous chloride. This is an illustrative example of the use of paired-ion, reversed-phase LC for the chromatography of ions.

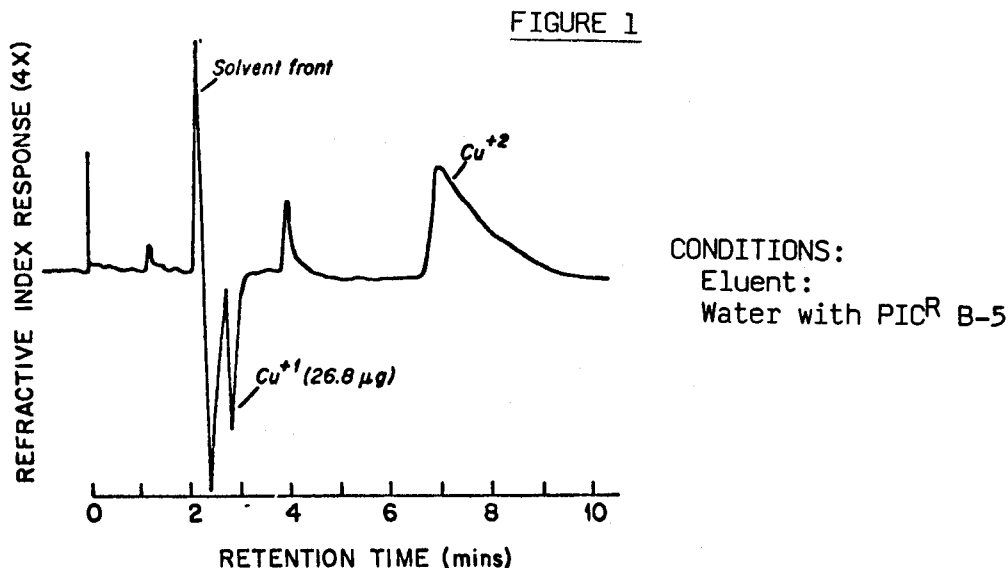


FIGURE 1. PAIRED ION RP-HPLC OF Cu^{+1} AND Cu^{+2} AS INITIALLY ADDED CuCl , USING A MOBILE PHASE WITH PIC^{R} B-5 WITH A FLOW RATE OF 2.0 ml/min.

In this particular example (Figure 1) cuprous ion elutes just after the solvent front, with a retention time of about 2.5 mins, while the cupric ion elutes much later as the broader peak at about 7 mins. PIC^{R} B-5 was the ion-pairing reagent, although other alkyl sulfonate anions could have also been used.

It should be emphasized that a new sample of cupric chloride analyzed under identical conditions contained almost exclusively cupric ion (+2) with very little cuprous (+1) present. "Old" samples of cuprous salts probably air oxidize to form cupric ion. Toxicologists and biologists should be careful to determine the specific nature of any metal species being used in animal studies since what is labelled on the bottle may not be what is in the bottle.

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