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LETTER TO THE EDITOR

Sputtering of polycrystalline metals by inert gas ions of low energy (100-1000 eV)

In continuation of our investigations on cathode sputtering we report here measurements of the sputtering yields of polycrystalline Cu, Ni, Fe and Mo, bombarded with monoenergetic Ne^+, A^+, Kr^+ and Xe^+ ions having energies ranging from 100–1000 eV.

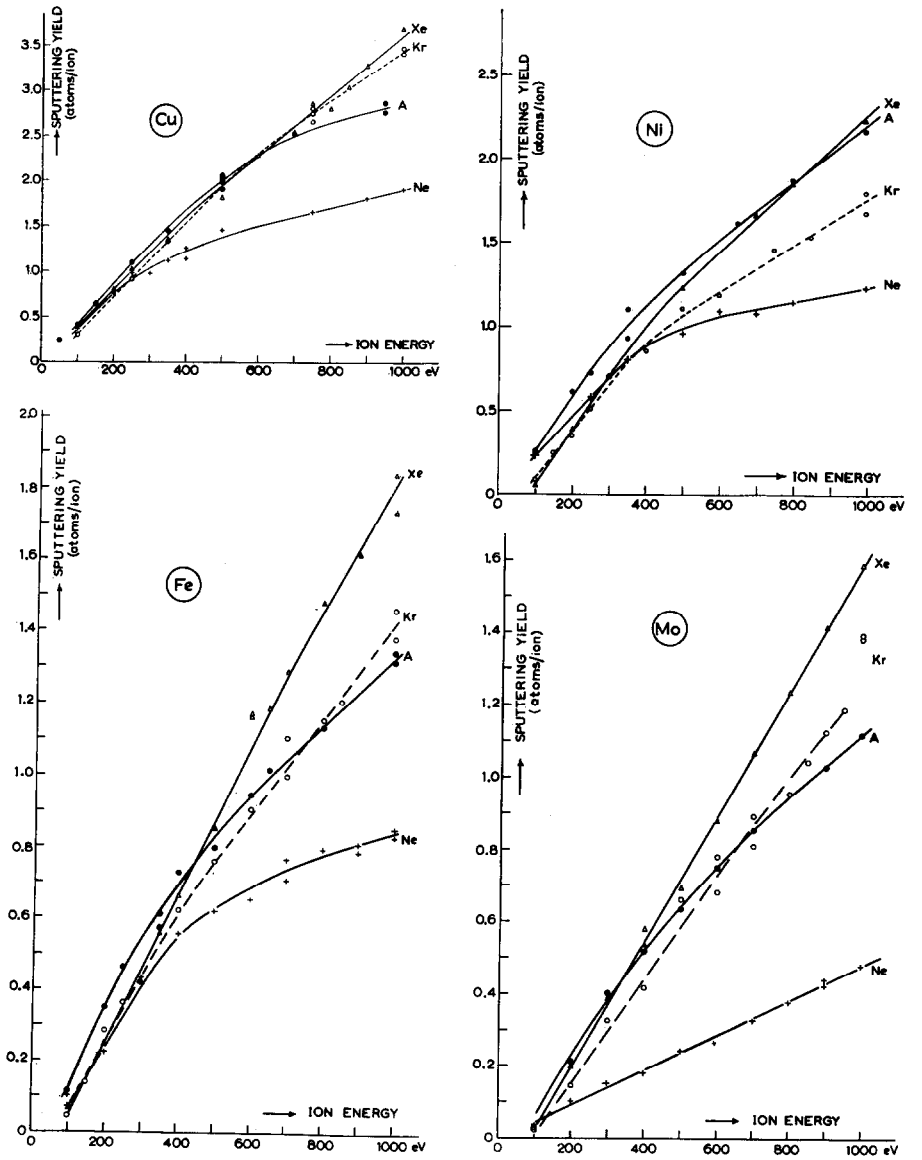

Fig. 1. Curves of sputtering yield versus ion energy for copper, nickel, iron and molybdenium respectively, bombarded with normally incident Ne^+, A^+, Kr^+ and Xe^+ ions.

In our investigations sputtering yields were calculated from the weight loss of a spherical target, immersed in a low pressure plasma, and from the quantity of charge arriving on the target. The ionic current density amounted to about 1.5 mA/cm^2. The sputtering time was chosen long enough to warrant a weight loss of at least 1 mg. This proved to be enough to ensure that the measured yield is independent of ionic current density and sputtering time; this means that there is no considerable influence of surface impurities.

The spherical targets, diameter 0.7 cm, were made from materials of very high purity.

A detailed description of the apparatus and of the method has been given in earlier papers [1)2)].

Recently Laegreid and Wehner [3)] measured the sputtering yields of the same and other metals, bombarded with Ne^+ and A^+ ions, having energies of 100, 200, 300 and 600 eV. Comparing our results for Ne^+ and A^+ with those of Laegreid and Wehner, we notice the following:

1. There is a good agreement of the Cu and Ni data in the two experiments, except in the higher energy region, where the yields for Ne^+ bombardment are smaller in our experiments than in those of Laegreid.
2. In the case of Fe and Mo the corresponding curves show the same shape in both experiments; the yields measured by Laegreid, however, are somewhat higher.

Both Laegreid's and our measurements have not been corrected for the secondary electron emission; this correction, however, should be small.

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