

X-ray microanalysis of electro-erosive powder materials, obtained from tungsten-nickel-iron (TNI) alloy wastes in water

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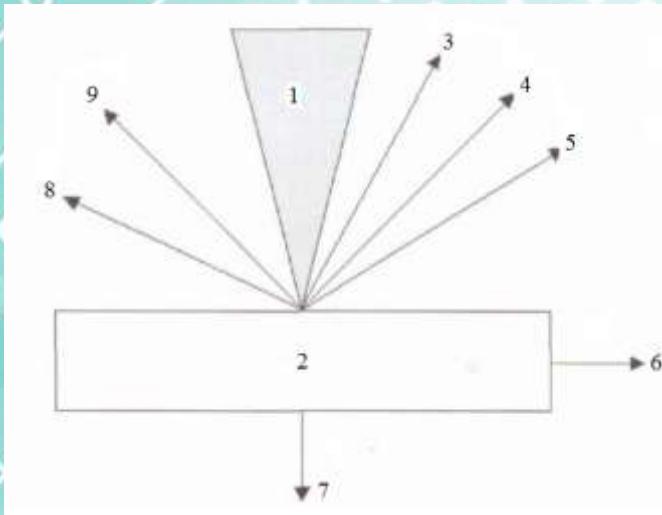
Introduction

Heavy alloys have a number of very valuable properties, due to which they are effectively used in many industries. Currently, one of the main problems of using these alloys is the presence in it of a significant amount of expensive tungsten [1-12]. This problem can be solved by grinding their waste and reuse. Existing industrial grinding technologies are distinguished by large tonnage, high energy costs and environmental problems. One of the promising and industrially inapplicable methods of grinding any electrically conductive material is the electroerosion method [13-19].

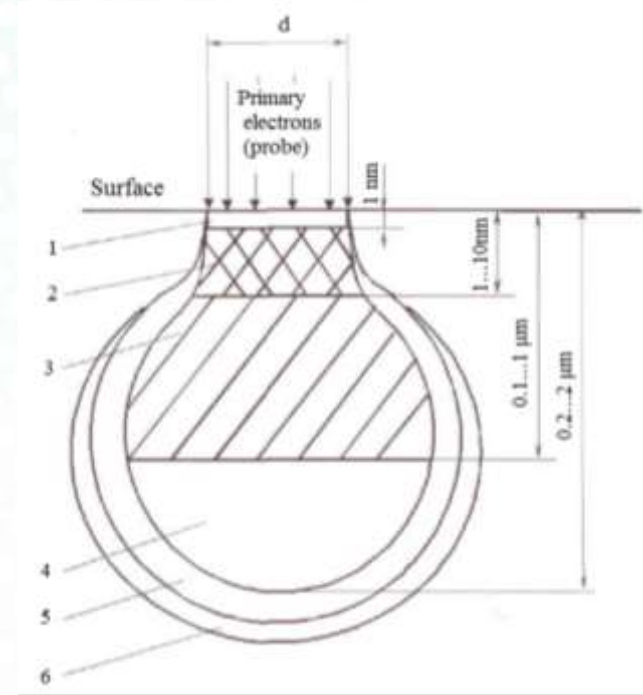
To develop technologies for the reuse of electro-erosion powders obtained from TNI alloy, and to evaluate the effectiveness of their use, complex theoretical and experimental studies are required.

The aim of the work was to study the elemental composition of electroerosive powders, obtained from TNI alloy waste in wate.

Materials and Methods

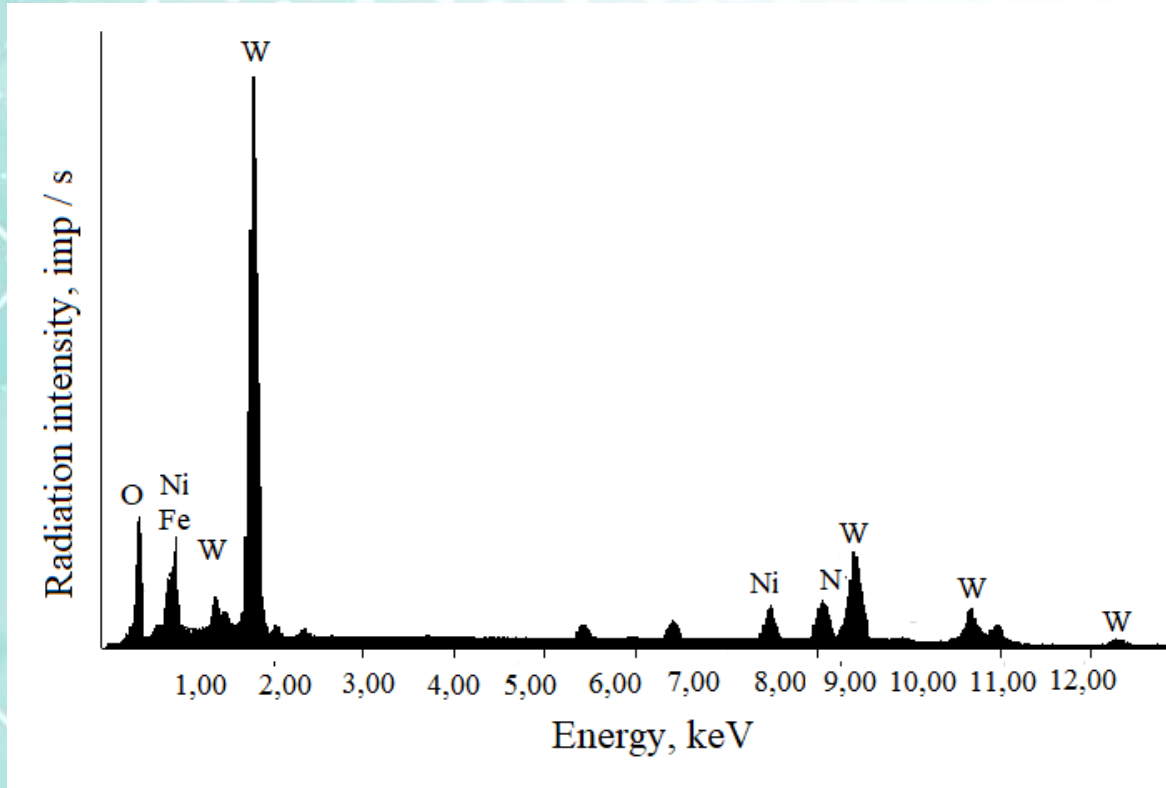


Effects of the interaction of an electron ray with the object: 1 – electron ray, 2 – object, 3 – reflected electrons, 4 – secondary electrons, 5 – Auger electrons, 6 – absorbed electrons current 7 – passed electrons, 8 – cathodoluminescent radiation, 9 – X-ray radiation



Signal areas and space resolution under irradiation of the object surface with a flow of electrons (probe). Areas of generation of: 1 – Auger electrons, 2 – secondary electrons, 3 – reflected electrons, 4 – characteristic X-ray radiation, 5 – deceleration X-ray radiation, 6 – fluorescence

Results



X-ray microanalysis on the surface of electro-erosion TNI alloy particles in distilled water

Conclusion

Based on the elemental composition study of the electro-erosion powders, obtained from waste of a TNI alloy in water, it was found that the main elements are tungsten, nickel, iron and oxygen. The study will determine the most relevant application area of the obtained samples and improve the quality of scientific and technological developments.

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