

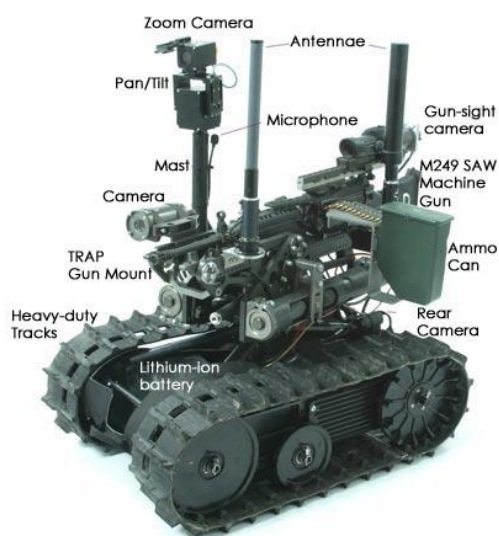
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## Automatic electrochemical determination of heavy metals and application to a remote-controlled robotic platform orpheus-hope

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### Abstrakt

Heavy metals are natural components of Earth's crust. They can be found in many places such as soil, water, and air. High concentration of heavy metals can affect negatively human health and environment. The main aim of this study is to determine heavy metals ions such as zinc, cadmium, lead, and copper by automatic electrochemical analysis. We chose a carbon tip as a working electrode. Furthermore, this system was applied into a remote-controlled robotic platform ORPHEUS-HOPE.



The commercial carbon tip electrode was used as working electrode for detection of cadmium, lead, and copper ions. By applying a conditioning time of 60 s at -0.9 V into  $\text{Hg}(\text{NO}_3)_2$  solution, thin-film mercury was created. This carbon tip electrode modified with mercury film was employed for detection of zinc ion. Firstly, effect of accumulation time was tested and then 120 s of accumulation time was chosen for finding

calibration curve as well as limit of detection of these heavy metals. Copper and zinc produced lowest limit of detection (200 nA).

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