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DIRECT ELECTROCHEMICAL SYNTHESIS OF COMPLEX GALLIUM, INDIUM AND THALLIUM FLUORIDES

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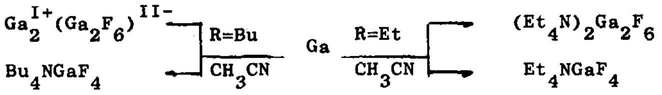
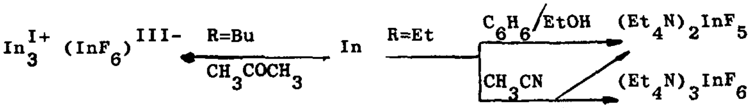
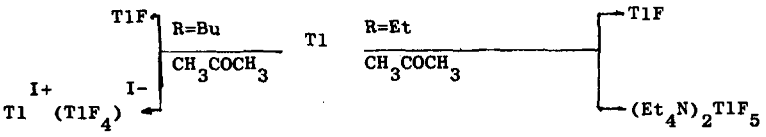
Direct electrochemical dissolution of gallium, indium and thallium anodes in presence of $R_4NF\cdot nHF$ (R=Et,Bu,n=3-8) in aprotic media has been investigated. It is well known that the most characteristic oxidation state of IIIA groupmetals are (1+) and (3+). Meantime as a result of electrochemical reaction some complexes with formal metal valancies differed from these values were isolated. It appears to be a result of either formation of the cluster anions or existance of the metal atoms with different oxidation states in one molecule. Thus anodic dissolution of Ga-electrode in presence of $R_4NF\cdot nHF$ yields the following complexes:



The products of electrochemical dissolution of indium anode in the system above depend highly upon the nature of the solvents:



An application of thallium anode in the system discussed yields mainly thallium (I) fluoride. Aside to TlF some complex thallium fluorides were isolated:



The possible mechanism of electrochemical reaction and the products formation pathway are discussed.