NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U.S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.
In connection with the known presence of Na₂O in liquid sodium, which is often employed as a heat carrier, the question of possible electrolytic transfer of oxygen in the medium arises. This article describes an experimental check on this phenomenon conducted by the d-c polarization method. The experiments were run at 300°C.

An accumulation of transferred oxygen was actually determined in the anodic part of the molten metal. The findings confirmed the initial assumption that transfer is caused by O⁻ ions, which originate from the strongly polarized molecule of Na₂O and which are probably enclosed into a solvate-type envelope of Na⁺ ions. An approximate balance of the quantities of oxygen transferred and coulombs expended strengthens the probability of the transfer by O⁻ ions. A similar phenomenon has been observed for the transfer of sulfur under similar conditions.

COMMENT:

The study is interesting because of the possibility that it may refer to maintenance and safety problems in the use of liquid sodium as a heat carrier — the problem of electrolytic corrosion in a nuclear reactor, for example. The assumption of oxygen transfer in ionic form in molten metals may well be a new approach to the problem.