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ABSTRACT

The thesis presents reëxamination of some aspects of changes in creep property brought about by electrolyte solution. This phenomena has been known as Rehbinder effect.

Study with aluminium system in non-corrosive 0.5 N Na_2SO_4 solution has been made. There is an enhancement of creep rate, both primary and steady state, in above solution compared to that in air.

Additive like oleic, acid which on dissociation of negatively charged ion has further enhanced the creep rate. Additive like butylamine, which is expected to form small amount of amminium positively charged ion does not change the creep rate noticably.

But on application of cathodic polarization, building up excess negative charge on metal side enhances creep rate in a rapid rate compared to that in 0.5 N Na_2SO_4 solution.

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But for butylamine, creep rate, both primary and steady state decrease and at high cathodic value of current shows sharp rise. Explanation on the basis of contact adsorption and electro adsorption has been brought forward for explaining the phenomena.

From works of other workers, and recent publications from this laboratory, it has been shown that decohesion phenomena or extra cohesion phenomena can not be explained on the basis of change in surface energy.

That it is absolute charge on near metal surface which is playing the major role in cohesion or decohesion phenomena to change creep rate is suggested.