

Transition Mechanism between Adhesive Wear Mode and Seizure Wear Mode of Current Collecting Materials

Koki NEMOTO Chikara YAMASHITA

In electric railways, measures to reduce wear of current collecting materials such as contact wires and contact strips are required to reduce the maintenance costs of current collecting materials based on the wear mechanisms. The authors have so far clarified that there are four mechanical wear modes of current collecting materials. However, the transition mechanism between adhesive wear mode and seizure wear mode has not been explained. In this paper, in order to elucidate the mechanism, the authors developed a model for analyzing contact temperatures considering the number of contacts. Using the developed model, the number of contacts was estimated by comparing analytical and experimental results. It shows that the number of contacts of seizure was less than that of adhesive wear. It was also clear that the transition to seizure occurs when the surface pressure exceeds the hardness of the material.