was varied from 13 nA/cm² to about 500 nA/cm². The electron emission yields measured at 300 eV under 13 nA/cm² irradiation was taken as reference.

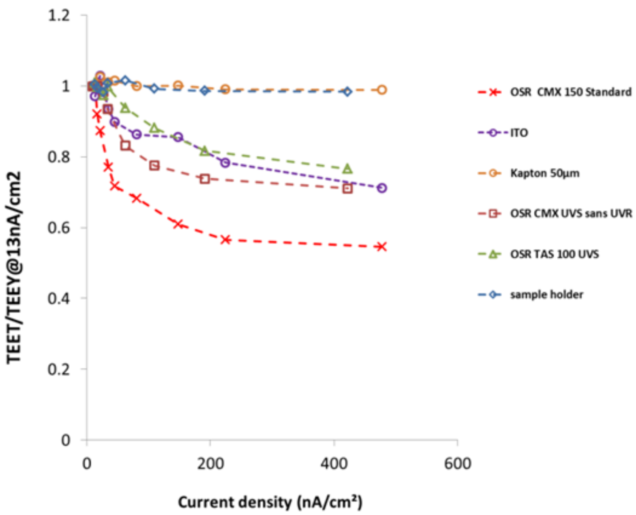

Fig. 8. Effect of the incident current density on the electron emission yield. Electron irradiation was performed at 300 eV

Fig. 8 shows that the EEY is highly sensitive to the variations of the current density. For cover glass samples we observed that lower is the electron flux; higher is electron emission yield. The effect of the current density was not observed for kapton in the investigated current density range. The current density effect was already observed by many authors [9-11] in dielectrics materials. Indeed, the accumulation of holes (positive charge) may lead to a substantial reduction of the electron emission by acting “internally” on the secondary electron transport to the surface as well as their escape into the vacuum. The generated secondary electrons, interacts with the holes and the inner electric field with relatively high effective cross-section (10^{-11}-10^{-14} cm²) [5-8]. The higher the holes density, the lower the mean free path of SEs. When the flux of incident electron is low: Drift diffusion and recombination of holes and electrons remains an efficient process that limits the holes density and the inner electric field (see Fig. 9). However, when the flux of incident electrons is high, these processes become less effective to prevent the formation of a high density of holes. The expected current density in the space environment (few tens pA/cm²) is much lower than that used in the present experiments.

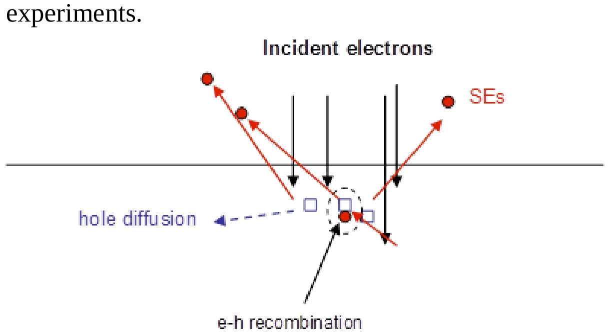

Fig. 9. Secondary electron emission attenuation mechanisms

IV. Conclusion

The electron emission properties of five surface spacecraft materials were measured. The EEY as well as the secondary electrons energy distributions were fitted with analytical models. The models parameters were extracted and tabulated. It was observed that the EEY for the studied cover glasses are highly sensitive to the incident current density. The practical consequence of this observation is that the EEY measured in laboratories (with high incident current flux, tens nA/cm²) maybe significantly lower than that of dielectrics in the space environment irradiated with few pA/cm². Given that the EEY sensitivity to the incident electron current is linked to the inner space charge generated by the irradiation, it’s obvious that the temperature variations should affect also the EEY. In the context of the spacecraft applications, the flux of incident particles effect as well as the temperature effect deserves to be analyzed in depth.

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