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Electron microscopy of thermally etched surfaces of NaCl

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Abstract. A study of thermally etched surfaces of NaCl by electron microscopy shows that steps with direction ⟨11⟩ consist of kinks with edges parallel to (100).

During his studies on the thermal etching of NaCl in air with the light microscope, A. Grinberg (1963, 1964 Thesis, Universidad Nacional de Buenos Aires) observed, on the etched surfaces, steps with general direction ⟨11⟩. As he stated, the resolution attainable did not permit him to observe if these steps were really formed by kinks with edges parallel to (100) as predicted by theory.

In collaboration with Dr. Grinberg we are at present engaged in a study of the process by electron microscopy. Observations are made on gold–carbon replicas of the thermally etched surfaces. During the examination of these replicas we have observed that, in every case, the steps with direction ⟨11⟩ actually consist of kinks with edges parallel to (100) (figures 1 and 2, plates†). The appearance of these kinks has been foretold in several papers on the theory of crystal growth; in particular, Kossel (1927) and Stransky (1928) postulated, on theoretical grounds, that the faces (110) cannot appear unless they are formed by kinks with edges parallel to (100).

To our knowledge this is the first experimental confirmation of their assertion.

References

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KOSSEL, W., 1927, *Nachr. Ges. Wiss. Göttingen*, 135–43.
STRANSKY, J. M., 1928, *Z. Phys. Chem.*, **136**, 259–78.

† Plates at end of issue.

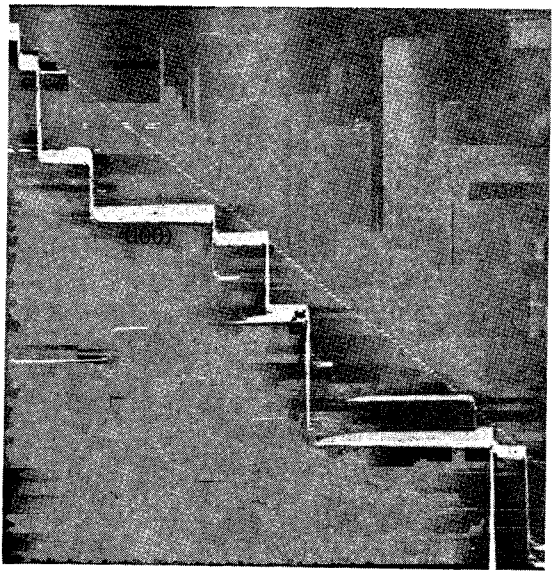

Figure 1. Surface of NaCl thermally etched for two hours at 700°c; Au–C replica. × 4900.

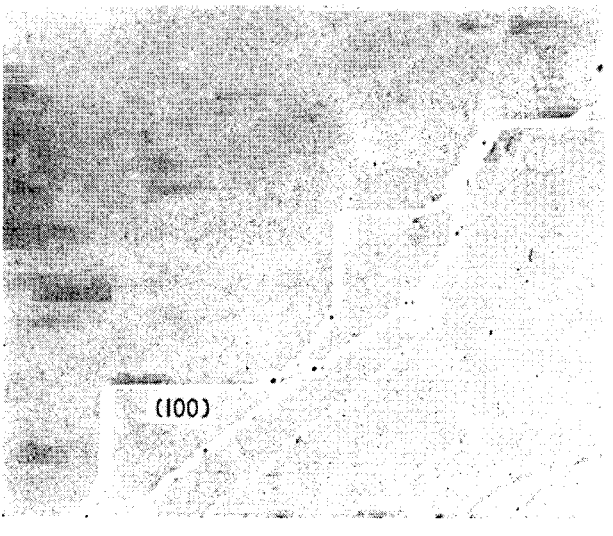

Figure 2. Surface of NaCl thermally etched for two hours at 680°c; Au–C replica. × 4900.