



Figure 2 (a) An area about a tilt boundary XY on the {100} faces of a NaCl bicrystal in a slowly-cooled condition after etching. (b) The same area photographed after a 5 minute pressurisation at 10 kbars, polishing (to remove 15 μm off the surface) and etching. Note the dislocation distributions AB and CD and that the mean etch pit density has increased in comparison with (a).

specimens were then subjected to a pressure of 10 kbars for 5 min in a piston-cylinder apparatus in a mixture of normal and iso-pentane. Following pressurisation the specimens were cleaned, dried, repolished and etched.

All the observations on monocrystalline specimens, including those of areas adjoining sub-boundaries (misorientations of the order of 10 min) failed to reveal the presence of fresh dislocations. An example is presented in fig. 1 which shows an area of the {100} face before and after pressurisation at 10 kbar. The observations with the bicrystal specimens revealed that existing dislocations had moved and fresh dislocations had been generated during the pressurisation cycle. The number of dislocations in areas adjoining the grain-boundary was observed in some instances to increase and in others to decrease. The mean dislocation density, ρ , however, in all larger areas examined before and after pressurisation either was approximately the same or increased, indicating that in the entire volume of the bicrystalline specimen it had increased. Fig. 2 shows an area where ρ has increased from $2.5 \times 10^6 \text{ cm}^{-2}$ (a) to $3.4 \times 10^6 \text{ cm}^{-2}$ (b) due to the pressurisation at 10 kbar. It should be noted that fresh dislocations are present, particularly along AB and CD. To ascertain whether this was purely a surface phenomenon the specimen was repolished and etched several times after fig. 2b was taken. It was established that the pronounced distribution of etch-pits CD ($\sim 200 \mu\text{m}$ in length) persisted to a depth of $\sim 100 \mu\text{m}$. The features of the area of fig. 2 after 100 μm had been removed

resembled, in fact, fairly closely, those of the unpressurised surface region. It is of course impossible to know whether dislocation activity at that depth had taken place as there the unpressurised state could not be determined. (The features of the opposite face of the specimen were entirely different.)

The bicrystal from which the specimens were prepared contained <20 ppm of cation and anion impurity. No precipitates are thought to be present in crystals of this purity and none were detected. In the absence of even small inelastic discontinuities, other than the grain-boundary, the generation of fresh dislocations during pressurisation is tentatively attributed to the presence of the grain-boundary.

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