

Tutorial problems and questions

1. Consider cold worked aluminium in which the dislocation density is increased from 10^{10} to 10^{14} per m^2 . Calculate the driving force for recrystallisation.

Answer

- The shear modulus of aluminium is about 26 G Pa. Hence, the energy associated with 10^{14} per m^2 of dislocations is (since the Burgers vector is 2.86 Å)

$$\frac{1}{2} \times 26 \times 10^9 \times 2.86^2 \times 10^{-20} \times 10^{14};$$

that is, the driving force is about 1 MJ per m^3 .