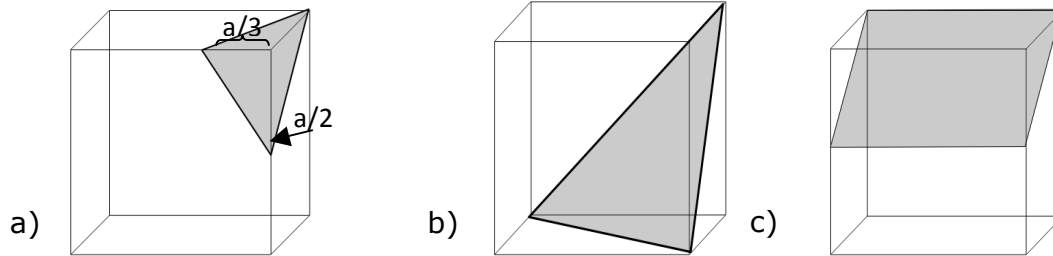




Exercises

1. Calculate the Miller Indices corresponding to the planes represented in the figures below.

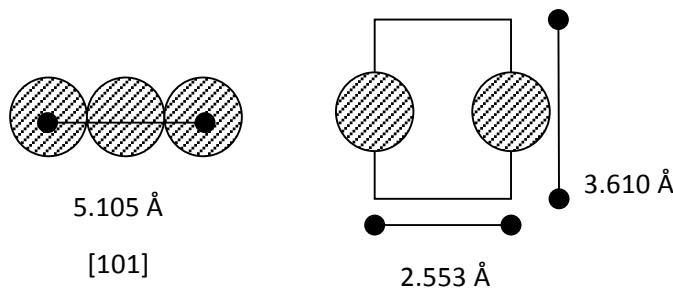


2. Draw the crystalline planes in a cubic lattice that present the following Miller indices:

- a) $(3\bar{2}\bar{1})$ b) $(\bar{2}01)$ c) $(1\bar{2}\bar{2})$ d) $(12\bar{3})$

3. The plane (220) and direction [101] of a unit cell of an orthogonal metal is shown below. Circles represent atoms.

- Draw the unit cell. To which crystalline system does it belong and how is this crystalline structure denominated?
- Calculate the planar density for the plane (111) in atoms/Å²
- Given that the density of the material is $\rho = 8.96 \text{ g/cm}^3$, calculate the molecular weight of the metal.
- If the fraction of vacancies at 500 °C is 1.4×10^{-6} , calculate the fraction of vacancies at 1000 °C.



Data:

$R = 8.314 \text{ J/mol K}$

$N_A = 6.023 \times 10^{23} \text{ atoms/mol}$