



Materials Science and Engineering

Evaluation Test

TOPIC 2. STRUCTURE OF MATERIALS

Important: Mark the right answer with a X. The correct answers will mark + 1 points while the incorrect answers will mark as -0.33 points. Non answered questions will not mark nor positively nor negatively. The resulting mark will not be smaller than 0 in any case. There is only one correct answer per question. Good luck!

A metal with a FCC structure has a lattice parameter of 4.08 \AA and density of $\rho = 19.3 \text{ g/cm}^3$. Calculate the atomic weight of the metal ($N_A = 6.023 \times 10^{23} \text{ atoms/mol}$).	
<input type="checkbox"/>	197.4 g/mol
<input type="checkbox"/>	394.7 g/mol
<input type="checkbox"/>	56.4 g/mol
<input type="checkbox"/>	$2 \times 10^{23} \text{ g/mol}$

The atomic radius of an atom that is present in a BCC unit cell having a lattice parameter of 2.87 \AA is:	
<input type="checkbox"/>	2.48 \AA
<input type="checkbox"/>	1.01 \AA
<input type="checkbox"/>	1.43 \AA
<input type="checkbox"/>	1.24 \AA

For a screw dislocation	
<input type="checkbox"/>	The burgers vector is perpendicular to the dislocation line and parallel to the direction of dislocation movement.
<input type="checkbox"/>	An extra half-plane of atoms is introduced in the lattice.
<input type="checkbox"/>	The burgers vector is parallel to the dislocation line and perpendicular to the direction of dislocation movement.
<input type="checkbox"/>	The movement occurs easier in non closed- packed directions.

Diffusion occurs faster:	
<input type="checkbox"/>	In materials with high melting point.
<input type="checkbox"/>	By vacancy diffusion than by interstitial diffusion.
<input type="checkbox"/>	In the BCC structure rather than in the FCC structure.
<input type="checkbox"/>	Along the volume (crystal lattice) than along the grain boundaries.

The Miller Indices for the following plane are:	
<input type="checkbox"/>	$(\bar{3} \bar{1} 2)$
<input type="checkbox"/>	$(\bar{1} \bar{3} 2)$
<input type="checkbox"/>	$[\bar{3} \bar{1} 2]$
<input type="checkbox"/>	$(1 \bar{3} 2)$

