Metallic Alloys and Material Properties Worksheet

Scoring guide · one credit per question · review written work against each rubric

Metallic Alloys and Material Properties

Question 1

Choice (1)

Atoms of the added element occupy some lattice sites in place of main-metal atoms.

Question 2

The added atoms distort the regular arrangement and can hinder the motion that lets layers slip. More force can then be needed to deform the material.

Question 3

Choice (2)

A smaller permanent indentation under the same conditions indicates greater hardness in this test.

Question 4

Conductivity is a property of the actual material and can also depend on its structure and processing. A measured or otherwise supported conductivity value is needed to compare with the requirement.

Choosing a Contact Material

Question 5

Choice (2)

Q has hardness 68 and relative conductivity 85, satisfying both thresholds.

Question 6

Hardness increases from 68 to 82, while relative conductivity decreases from 85 to 67.

Question 7

75 − 67 = 8 relative conductivity units.

Question 8

Choice (1)

P and Q now both meet hardness and conductivity. R still has conductivity below 75.