

Name: _____ Date: _____

Answer Key: Protocol 12: High-Stakes Laboratory Integrity Assessment

Demonstrate the foundational safety competencies required for advanced university-level research environments and industrial laboratory leadership.

1. Which of the following is the most appropriate action if a high-pressure gas cylinder begins to leak or tip in a senior-level lab setting?

Answer: B) Immediately evacuate the area and alert the designated safety officer.

High-pressure cylinders contain immense potential energy; attempting to catch or fix a falling cylinder can lead to catastrophic injury or explosion. Evacuation and professional response are the standard protocols.

2. Standard prescription eyeglasses are considered a valid substitute for OSHA-compliant safety goggles when handling volatile organic compounds.

Answer: B) False

Prescription lenses lack the necessary side shielding and impact resistance required to protect eyes from chemical splashes or high-velocity debris.

3. When diluting concentrated sulfuric acid for an experiment, you should always add the _____ to the _____ to prevent exothermic splashing.

Answer: C) Acid; Water

Adding acid to water (AA) allows the water to dissipate the heat generated during the dissolution process, preventing the mixture from boiling and spraying corrosive liquid.

4. What is the primary function of a SDS (Safety Data Sheet) in a 12th-grade chemistry laboratory?

Answer: C) To outline the chemical properties, hazards, and emergency response measures for a substance.

The SDS is a standardized document that provides comprehensive safety information regarding chemical hazards, handling, and first-aid measures.

5. A student accidentally breaks a mercury thermometer; the best course of action is to notify the instructor and use a _____ to contain the vapor.

Answer: B) Specialized spill kit

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Mercury is a neurotoxin that vaporizes at room temperature; specialized spill kits use powders to amalgamate the mercury and prevent inhalation hazards.

6. It is acceptable to wear contact lenses under safety goggles as long as the experiment does not involve any corrosive liquids.

Answer: B) False

Contact lenses can trap chemical vapors against the cornea or become fused to the eye in the event of a chemical splash, exacerbating injuries.

7. Before heating a test tube over an open flame, the mouth of the tube should be pointed:

Answer: C) Away from yourself and all other students in the vicinity.

Rapid heating can cause 'bumping' or the sudden expulsion of liquids; pointing the tube away prevents accidental chemical burns to bystanders.

8. In the event of a large chemical spill on your clothing, you should use the _____ for at least _____ minutes.

Answer: B) Safety Shower; Fifteen

Safety showers are designed to flood the body with water. A 15-minute duration is required to ensure all chemical residues are thoroughly diluted and washed away.

9. Long hair must be tied back and loose jewelry must be removed primarily to prevent physical entanglement in equipment or contact with flames.

Answer: A) True

Tying back hair and removing jewelry are essential scaffolding behaviors that minimize the risk of fire hazards and mechanical accidents in the lab.

10. Which of these is the correct behavior when working with a fume hood?

Answer: C) Keep materials at least 6 inches inside the hood to ensure proper laminar flow.

Operating within the back two-thirds of the hood ensures that the ventilation system can effectively capture and remove hazardous vapors without them spilling into the room.