

***** EXAMINATION *****

TECHNIQUES FOR SURFACE STRUCTURE DETERMINATION

1. **Low energy electron diffraction is most suitable for**
 - a) long-range order determination
 - b) disordered materials
 - c) amorphous materials
 - d) All of the above

2. **Low energy electron diffraction can provide short range information**
 - a) using simple theoretical analysis
 - b) using detailed theoretical analysis
 - c) using simple assumptions
 - d) using detailed assumptions

3. **Low energy electrons are**
 - a) strongly back-scattered by the electrons from x-ray diffraction
 - b) weakly back-scattered by the electrons from x-ray diffraction
 - c) strongly back-scattered by the electrons of the surface atoms
 - d) weakly back-scattered by the electrons of the surface atoms

4. **During diffraction**
 - a) energy is conserved
 - b) energy is used
 - c) either a or b
 - d) neither a or b

5. **During diffraction**
 - a) the magnitude of the electron momentum is conserved
 - b) the magnitude of the electron momentum increases
 - c) either a or b
 - d) neither a or b

6. **During diffraction**
 - a) the direction of momentum is constant
 - b) the direction of momentum is changed
 - c) the direction of momentum is not changed
 - d) None of the above

7. **Diffracted electrons are**
- a) elastically scattered
 - b) inelastically scattered
 - c) elastically ordered
 - d) inelastically ordered
8. **Secondary electrons are**
- a) elastically scattered
 - b) inelastically scattered
 - c) elastically ordered
 - d) inelastically ordered
9. **Diffracted electrons are also known as**
- a) layers
 - b) cubes
 - c) spots
 - d) rays
10. **Images may be captured for LEED by**
- a) photographic film
 - b) video camera
 - c) either a or b
 - d) None of the above
11. **Irregularly-spaced steps produce**
- a) streaky spots
 - b) blurred LEED spots
 - c) rows of spots
 - d) Any of the above
12. **Surfaces that produce no LEED pattern and only diffuse the background**
- a) may be amorphous
 - b) may be disordered
 - c) may be glassy
 - d) Any of the above
13. **Dynamic LEED theory assumes the calculation of amplitude and phase**
- a) due to ion core scattering
 - b) due to multiple scattering
 - c) due to inelastic events
 - d) All of the above
14. **LEED spot intensities are measured by**
- a) 35 mm cameras
 - b) film cameras
 - c) digital video cameras
 - d) Any of the above

15. **Dynamical LEED methodology**
- a) measures the initial structure
 - b) makes an initial guess for the structure
 - c) may require several tests
 - d) None of the above
16. **Dynamical LEED methodology**
- a) compares theory and experimental data
 - b) changes the theory during the experiment
 - c) separates theory from the experimental data
 - d) None of the above
17. **The Pendry R-factor is graphed using**
- a) a contour map
 - b) a base map
 - c) a step versus grid map
 - d) None of the above
18. **Dynamical LEED experiments are**
- a) slow for simple analysis
 - b) rapid for simple analysis
 - c) variable for simple analysis
 - d) None of the above
19. **Dynamical LEED experiments require**
- a) simple instrumentation
 - b) complex instrumentation
 - c) expensive instrumentation
 - d) both a and c
20. **Information provided by dynamical LEED experiments include**
- a) temperature dependant phenomena
 - b) the size of the adsorbate unit cell
 - c) the symmetry of the surface
 - d) Any of the above

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