

***** EXAMINATION *****

REFLECTION HIGH ENERGY ELECTRON DIFFRACTION.

1. **For low energy electron diffraction, the low energy electrons are used to**
 - a) provide small elastic scattering X-section for back-scattered electrons
 - b) provide large elastic scattering X-section for back-scattered electrons
 - c) provide small elastic scattering X-section for forward-scattered electrons
 - d) provide large elastic scattering X-section for forward-scattered electrons
2. **In low energy electron diffraction, the low energy electrons are used to**
 - a) keep the penetration depth of the electrons short
 - b) keep the penetration depth of the electrons long
 - c) keep the penetration depth of the electrons unchanged
 - d) None of the above
3. **In experimental arrangements for reflection high energy electron diffraction,**
 - a) the grid is used to repel primary and inelastically scattered electrons
 - b) the grid is used to repel secondary and inelastically scattered electrons
 - c) the grid is used to repel primary and elastically scattered electrons
 - d) the grid is used to repel secondary and elastically scattered electrons
4. **In experimental arrangements for reflection high energy electron diffraction,**
 - a) back-scattered electrons strike a phosphor screen
 - b) back-scattered electrons strike a carbon screen
 - c) forward-scattered electrons strike a phosphor screen
 - d) forward-scattered electrons strike a carbon screen
5. **The RHEED pattern can be used to measure surface periodicity**
 - a) orthogonal to the incidence plane by noting separation between streaks
 - b) below the incidence plane by noting separation between streaks
 - c) above the incidence plane by noting separation between streaks
 - d) from the incidence plane by noting separation between streaks
6. **Rocking curves can be used with dynamical theory**
 - a) to induce detailed atomic spacing
 - b) to view detailed atomic spacing
 - c) to extract detailed atomic spacing
 - d) None of the above

7. **Since the pathlength of RHEED electrons is high, the electron may pass**
- a) through a small surface feature and cause true bulk-like diffraction
 - b) through a large surface feature and cause true bulk-like diffraction
 - c) through a small surface feature and cause diffused diffraction
 - d) through a large surface feature and cause diffused diffraction
8. **Bulk diffraction**
- a) reduces the intensity in RHEED streaks
 - b) increases the intensity in RHEED streaks
 - c) reduces the intensity in RHEED patterns
 - d) increases the intensity in RHEED patterns
9. **Bulk diffraction**
- a) causes blurred spots in RHEED streaks
 - b) causes blurred spots in RHEED patterns
 - c) causes sharp spots in RHEED streaks
 - d) causes sharp spots in RHEED patterns
10. **RHEED is especially suited to**
- a) molecular beam epochs
 - b) molecular beam epitaxy
 - c) molecular beam electrons
 - d) None of the above
11. **X-ray absorption processes are very similar to**
- a) optical absorption
 - b) spectral absorption
 - c) remote sensing
 - d) None of the above
12. **X-rays are energetic enough to ionize both**
- a) valence electrons and some core electrons
 - b) ion electrons
 - c) spectral electrons
 - d) None of the above
13. **Small intensity modulation is also known as**
- a) rough structure
 - b) fine structure
 - c) layered structure
 - d) None of the above
14. **The conventional EXAFS technique can be more surface sensitive by**
- a) roughing
 - b) smoothing
 - c) grazing incidence
 - d) None of the above

15. **Low energy electrons have a**
- a) short inelastic mean free path
 - b) long inelastic mean free path
 - c) short elastic mean free path
 - d) long elastic mean free path
16. **A long data collection time requires UHV to**
- a) minimize surface contamination during data acquisition
 - b) maximize surface contamination during data acquisition
 - c) minimize surface contamination during post processing
 - d) maximize surface contamination during post processing
17. **Alteration of incidence angle can be used to**
- a) minimize surface contamination during data acquisition
 - b) determine the alignment of adsorbate bonds
 - c) determine the dispersion of adsorbate bonds
 - d) determine the spreading of adsorbate bonds
18. **RHEED provides**
- a) more information than LEED
 - b) less information than LEED
 - c) similar information to LEED
 - d) None of the above
19. **RHEED is**
- a) rapid for simple analysis
 - b) rapid for complex analysis
 - c) slow for simple analysis
 - d) None of the above
20. **RHEED requires**
- a) simple instrumentation
 - b) complex instrumentation
 - c) very expensive instrumentation
 - d) None of the above

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