

Tfy-3.468 Surface Physics

Examination

15.12.2008

1. Explain shortly what is
 - a) Surface plasmon
 - b) Incommensurate structure
 - c) Surface energy

2. Iridium is a fcc metal with a lattice constant of 3.84 \AA .
 - a) Calculate the atomic density of the Ir(100) surface.
 - b) Sketch the LEED pattern of the unreconstructed surface.
 - c) The Ir(100) surface undergoes a reconstruction to Ir(100)-(5x1) structure. Sketch the LEED pattern from this surface.

3. Most of surface sensitive techniques are used in vacuum conditions. Why is the vacuum needed, and what is a proper vacuum for surface studies? Start your reasoning from the kinetic gas theory.

4.
 - a) How does a scanning electron microscope work and what can be studied with it?
 - b) How does a scanning tunneling microscope work and what can be studied with it?

5. What are the different mechanisms for film growth on single crystal surfaces? How can the growth be studied?