**Fundamentals of Materials Science Homework 3**

**Name: Xiao，Liyang Date: 01/31/2017 Student #: 15090215**

Checklist before you start this homework. (The boxes are clickable.)

🗹I have read the atomic structure related portion (p.18-26) of the chapter.

🗹I have worked on the Example Problems and Concept Check questions.

**Homework Problems:**

1. **Chemical analysis in materials science laboratories is frequently done by means of the scanning electron microscope. In this instrument, an electron beam generates characteristic x-rays that can be used to identify chemical elements. This instrument samples a roughly cylindrical volume at the surface of a solid material. Calculate the number of atoms sampled in a 1 m-diameter by 1 m-deep cylinder in the surface of solid copper.**

**Solution:**

Atomic radius of copper:0.128nm

Surface area:





1. **One mole of solid MgO occupies a cube 22.37 mm on a side. Calculate the density of MgO (in g/cm3).**

**Solution:**

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1. **Calculate the dimensions of a cube containing 1 mole of solid magnesium.**

**Solution:**

amu=24.31 ρ=1.74g/cm ³



