

Answer on Question #47013 – Physics – Other

Question:

According to photoelectric effect electrons eject from a metal surface when photons with particular frequency strikes it. So, when electrons eject can't it affect the shape or property of that metal because electrons are ejecting and atoms became unstable and to maintain stability they share electrons.

Answer:

Atoms in metals are bound with each other via metal bonds – it may be described as the sharing of freely moving electrons in the space among the fixed crystalline lattice metal ions which are positively charged. Negatively charged electrons are attracted to the positive metal ions by electrostatic force. In a more quantum-mechanical view, these shared electrons divide their density equally over all atoms that function as neutral (non-charged) entities.

The photoelectric effect is the phenomenon of many metals to emit electrons from their surface when the light shines upon them. This effect can be attributed to the transfer of electromagnetic energy from the quanta of light into the kinetic energy of electrons, which are emitted from the metal surface.

Electrons, emitted from the metal, carry negative charges. According to the law of conservation of electric charge, surface of metal becomes charged positively and attracts emitted electrons back to the metal. They move back and become absorbed by the surface.

Crystalline lattice of metal does not change in this process – ions of metal do not move when the photoeffect occurs. That's why properties or shape of the metal, which depends from the configuration of the crystalline lattice do not change either.