The optical properties of nickel – carbon nanocomposites prepared by RF–DC magnetron sputtering method

Vali Dalouji\textsuperscript{1}, Seyed Mohammad elahi\textsuperscript{1,2}

\textsuperscript{1}Department of Physics, Razi University, Kermanshah, Iran
\textsuperscript{2}Plasma Physics Research Center, Science and Research Branch, Islamic Azad University, Tehran, Iran

Dalouji@yahoo.com

Abstract

Ni-C nanocomposite films were successfully grown on quartz and glass substrates by co-sputtering technique. The thin films were deposited in argon plasma at room temperature in different deposition times from 20 to 600s. Prepared thin films were annealed in air at different temperatures (from 373 to 1273 K) for 2h. Films were characterized by using Ultraviolet Visible spectrophotometry. In this study, we found that the optical properties of thin films were strongly influenced by both the deposition time and annealing temperatures \[1, 2, 3\]. Surface Plasmon resonance (SPR) pikes (Fig.1), were observed in the Ni-C composite films due to the formation of nanometer - size Ni particles in the matrix \[4\]. The average radius of Ni clusters (Fig.2), the optical energy gap, Refractive index, the extinction coefficient and optical conductivity of thin films have been also studied \[5\].

References

Fig. 1: The absorption spectrum for Ni – C nanocomposite film annealed at 800 K.

Fig. 2: The average size of Ni clusters in nanocomposite films at different anneal temperature.