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Title

Truncated spherical voids for nearly omnidirectional optical absorption

Source

Optics Express, vol.19, no.21, 10 Oct. 2011, 20642-9. Publisher: Optical Society of America, USA.

Abstract

Truncated spherical voids nanostructured tungsten films are shown to have nearly perfect absorption with characteristics of broad-band, polarization-independent and wide-incidence angle in near infrared and visible regime. Through optimizing material and structural parameters, we can achieve the absorbance above 90% from 420THz to 600THz within incidence angle from 0degree to 60degree for TE polarization and from 450THz to 800THz within incidence angle from 0degree to 75degree for TM polarization. In particular, absorbance can achieve 99.9% at 550.5THz for both polarizations under normal incidence. Such strong absorption is explained using multilayer effective media theory and cavity resonance. (26 References).