

High Absorptance Coatings for THz Applications

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Abstract— High absorptance materials find application throughout the electromagnetic spectrum as radiation terminations, calibration standards, and glint reduction coatings. Successful use of materials at millimeter through sub-millimeter wavelengths requires an accurate knowledge and control over their thermal, mechanical, and electromagnetic properties in order to achieve the desired response while minimizing mass and volume. In practice, the achieved *blackness* is intimately linked to the material properties and geometry. Here, we summarize the characteristics of a variety of tunable artificial dielectric mixtures appropriate for THz applications at room and cryogenic temperatures. Theoretical guidelines for their application will be provided in the context of the effective-medium mean-field-approximation. The performance of these coatings as elements of reflectance standards, radiometric flux calibrators, passive thermal radiators, and stray light suppression baffles for imaging systems will be reviewed.