vent as a low-molecular-weight (2 to 4 repeat units) powder. The only way found to date to keep linear polyazomethines in solution is by adding solubilizing side groups. However, these groups sacrifice certain polymer properties. These hyperbranched polyazomethines are high molecular weight and fully aromatic.

This work was done by Dean Tigelaar of Ohio Aerospace Institute for Glenn Research Center. Further information is contained in a TSP (see page 1).

Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steven Fedor, Mail Stop 4–8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-18642-1.

Carbon Nanotubes on Titanium Substrates for Stray Light Suppression

Goddard Space Flight Center, Greenbelt, Maryland

A method has been developed for growing carbon nanotubes on a titanium substrate, which makes the nanotubes ten times blacker than the current state-of-the-art paints in the visible to near infrared. This will allow for significant improvement of stray light performance in scientific instruments, or any other optical system.

Because baffles, stops, and tubes used in scientific observations often undergo loads such as vibration, it is critical to develop this surface treatment on structural materials. This innovation optimizes the carbon nanotube growth for titanium, which is a strong, lightweight structural material suitable for spaceflight use. The steps required to grow the nanotubes require the preparation of the surface by lapping, and the deposition of an iron catalyst over an alumina stiction layer by e-beam evaporation.

In operation, the stray light controls are fabricated, and nanotubes (multi-walled 100 microns in length) are grown on the surface. They are then installed in the instruments or other optical devices.

This work was done by John Hagopian, Stephanie Getty, and Manuel Quijada of Goddard Space Flight Center. Further information is contained in a TSP (see page 1).
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