

## Multiband luminescence of multi-rare-earth-ions-codoped telluride glasses

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In recent years, near- and mid-infrared lasers operating in the wavelength region of 1.5-3.0  $\mu\text{m}$  are attracting interest of researcher owing to its various applications in optical communication, medical surgery, eye-safe laser radar, remote sensing, atmosphere pollution monitoring, and so on. New materials are being searched for effective working medium of these lasers. Glasses, crystal and rare-earth ions should be considered because the hosts for dopants are cost-effective and easy to produce in large scale, and rare-earth materials are abundant in nature. Rare-earth doped fluoride, fluorophosphate glasses, telluride and fluorotelluride glasses, chalcogenide glasses have been reported for near- and mid-infrared luminescence. However, nearly all the literatures concentrated on the emissions at a single band instead of multiband luminescence.

In our present work, we have simultaneously observed multiband luminescence around 1.34, 1.53, 1.80, 2.10 and 2.70  $\mu\text{m}$  in  $\text{Er}^{3+}$ - $\text{Tm}^{3+}$ - $\text{Nd}^{3+}$ -codoped telluride glasses with the excitation of 808 nm pump laser diode. We have also explored luminescence mechanism of the system including energy transfer and cross relaxation processes, which gives an insight view of the luminescence principle of multiple rare-earth ions co-doped glass.

This new material can serve as a candidate for the promising super broadband optical fiber source which may find its applications in future ultra-broadband optical communication and advanced medical imaging.

### Biography

Chun Jiang received his Ph.D. degree from Shanghai Institute in Optics and Fine Mechanics, the Chinese Academy of Sciences in 1999. From 1999 to 2004, he worked as postdoctoral research fellow and Associate Professor in State Key Laboratory of Advanced Optical Communication Systems and Networks, Shanghai Jiao Tong University, China. Since 2005, he has been a Professor. From 2005 to 2006, he visited the Joannopoulos Research Group at MIT. His current research interests are in photonic materials and devices, photonic crystals, WDM transmission systems. He is the author or co-author of over 100 journal articles, and holds ten issued Chinese patents.

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