



Yb-doped glass material for laser
cooling and high power fibers

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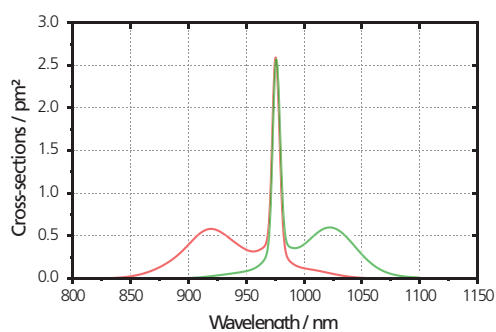
Cover: Laser-active rod (Ytterbium-doped silica glass) during pumping with infrared light.

Top: Production of preforms for active laser fibers on the MCVD system.

Ambition

We provide Yb-doped glass material produced by gas-phase MCVD fabrication for applications fiber laser application.

The background loss and efficiency of that material is close the quantum limits, thus, allowing even for laser cooling.



Emission- and absorption cross-section of the Yb-doped material.

Characteristics

- Highest purity Yb-doped glass material
- Lowest photodarkening (< 10 dB @ 633 nm)
- > 90% laser efficiency when used in fiber lasers
- Athermal compositions (reduced dn/dT)
- Low-NA and matched NA ($\Delta n < 10^{-4}$) to cladding fused silica available

Application

In the future, advances in solid-state laser cooling may lead to all-optical, compact and vibration-free cryogenic cooling, and as an application, reduce thermal noise in semiconductor-based single-photon detectors or quantum information processing circuits, among others.



Yb-doped rods without cladding layer.

Technology

- Gas-phase MCVD doping
- Surface Plasma CVD
- Large volumes and preprocessed rods for preforms
- 3D refractive index characterization
- Stress annealing

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