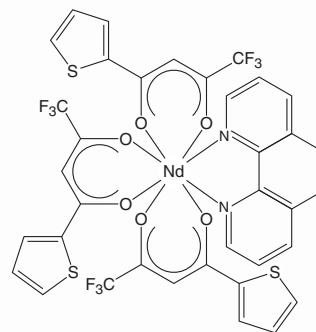


**Abstract:** A polymer host material, based on a cycloaliphatic diepoxy cured with a fluorinated dianhydride, has been developed. When activated with the rare-earth-ion-doped complex, neodymium(thenoyltrifluoroacetone)<sub>3</sub> 1,10-phenanthroline, the typical absorption and emission lines of the Nd<sup>3+</sup> ion are detected. Luminescence quenching, which usually occurs in polymers due to high-energy vibrations from O–H and C–H chemical bonds, is eliminated by the neutral 1,10-phenanthroline ligand and by applying fluorinated chelates to the complex, respectively, and absorption due to the polymer host occurs only in the wavelength range longer than 1100 nm. Optimization of the fabrication procedure of both, host material and optical structure, leads to steady-state laser emission from a channel waveguide near 1060 nm, providing up to 440 μW of output power from the waveguide structures developed. To the best of our knowledge, this result represents the first steady-state laser in a solid polymer host.



The chemical formulas of Nd(TTA)<sub>3</sub>phen

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## Steady-state lasing in a solid polymer

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