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Laser-selective excitation and polarisation studies of BaF₂: Tm³⁺ single crystals

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Abstract content
   (Max 300 words)
Formatting &
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Site-selective laser excitation studies of BaF₂:Tm³⁺ single crystals performed at temperatures ranging from 10 K to 75 K are reported. There is a single dominant centre at the dopant concentrations of up to 0.1 mole% used. All the crystal-field energy levels for three multiplets (³H₆, ³H₄ and ³F₂) of the centre and the fluorescence lifetime of the ³H₄ multiplet are presented. From polarisation ratio measurements in <111>-oriented crystals the dominant centre is confirmed to be of C_{3v} symmetry, with the charge-compensation interstitial F⁻ ion in the next nearest neighbour position to the Tm³⁺ ion. Symmetry labels (irrep labels) have been assigned to the crystal-field energy levels. Vibronic coupling is apparent.

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