Supporting Information

Synthesis and crystal structure of the europium(II) hydride oxide iodide Eu$_5$H$_2$O$_2$I$_4$ showing blue-green luminescence

Daniel Rudolph[1], Thomas Wylezich[2], Philip Netzsch[3], Björn Blaschkowski[1], Henning A. Höppe[3], Philippe Goldner[4], Nathalie Kunkel[5], Jean-Louis Hoslauer[1] and Thomas Schleid[1,*]

[1] Institut für Anorganische Chemie, Universität Stuttgart, Pfaffenwaldring 55, 70569 Stuttgart, Germany; blaschkowski@iac.uni-stuttgart.de (B.B.)

[2] Institut für Anorganische Chemie, Technische Universität München, Lichtenbergstrasse 4, 85747 Garching, Germany; thomas.wylezich@tum.de

[3] Institut für Physik, Universität Augsburg, Universitätsstraße 1, 86159 Augsburg, Germany

[4] Chimie ParisTech, PSL University, CNRS, Institut de Recherche de Chimie Paris, 75005 Paris, France

[5] Institut für Anorganische Chemie, Georg-August-Universität Göttingen, Tammannstrasse 4, 37077 Göttingen, Germany
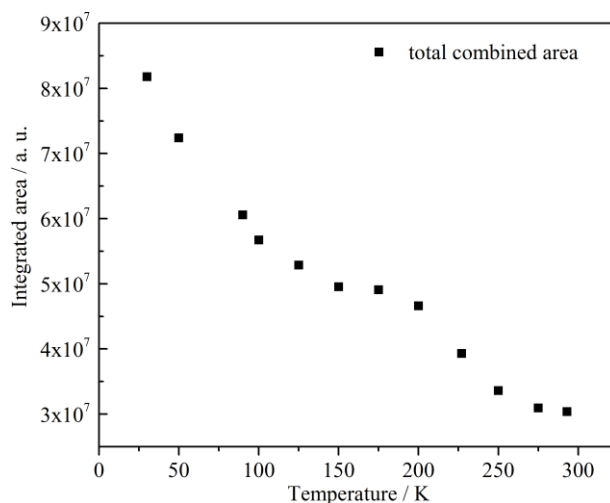
Figure S1. Temperature-dependent intensity of the emission (peak area) of Eu$_5$H$_2$O$_2$I$_4$. The quenching temperature is estimated to be around 110 K.
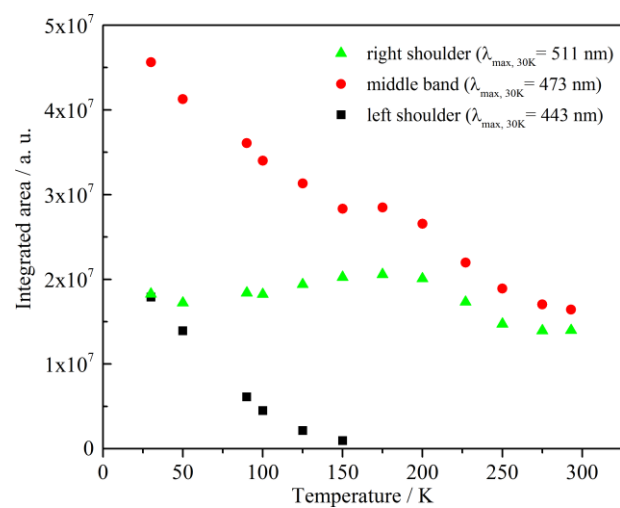
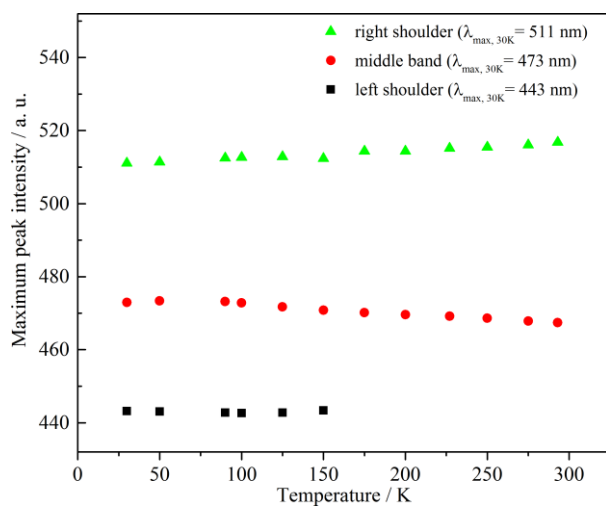**Figure S2.** Integrated area of the three emission bands of $Eu_5H_2O_2I_4$ resulting after deconvolution.

Figure S3. Change of the three individual emission positions in $Eu_5H_2O_2I_4$ with temperature.

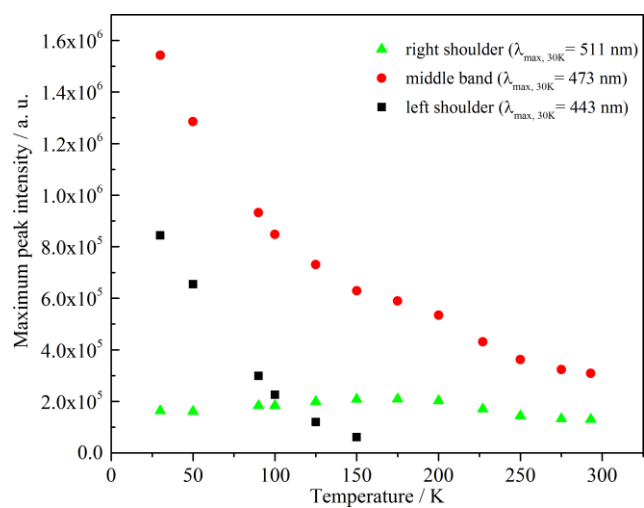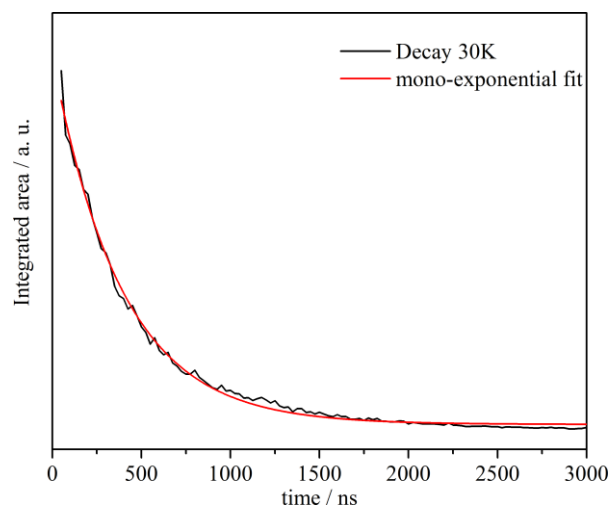**Figure S4.** Maximum peak intensity of the three emission bands in $Eu_5H_2O_2I_4$ after deconvolution.

Figure S5. Decay curve of $Eu_5H_2O_2I_4$ at 30 K. Fitting of the parameters using a mono-exponential decay results in a lifetime of the excited state of 388±5 ns.

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Refinement of F^2^ against ALL reflections. The weighted R-factor wR and
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on F, with F set to zero for negative F^2^. The threshold expression of
F^2^ > 2sigma(F^2^) is used only for calculating R-factors(gt) etc. and is
not relevant to the choice of reflections for refinement. R-factors based
on F^2^ are statistically about twice as large as those based on F, and R-
factors based on ALL data will be even larger.
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_atom_sites_solution_secondary   difmap
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 are estimated using the full covariance matrix. The cell esds are taken
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 used when they are defined by crystal symmetry. An approximate (isotropic)
 treatment of cell esds is used for estimating esds involving l.s. planes.
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