Supporting Information

Spectroscopic properties of LaGaO$_3$:V, Nd$^{3+}$ nanocrystals as a potential luminescent thermometer

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Fig. S1. Representative TEM images of LaGaO$_3$:V nanocrystals annealed at 600$^\circ$C - a), 700$^\circ$C –b), 800$^\circ$C- c), 1000$^\circ$C – d) and 1100$^\circ$C –e);
Fig. S2. XRD patterns of LaGaO$_3$:1%V nanocrystals annealed at different temperatures.

Fig. S3. Normalized emission spectra of LaGaO$_3$:1% nanocrystals annealed at different temperatures and measured at -150°C.
Fig. S4. Emission spectra of LaGaO₃:0.1%V nanocrystals annealed at 600°C- a), 700°C –b), 800°C- c), 1000°C – d) and 1100°C –e) measured at the temperature range from -300°C to 150°C.

Fig. S5. Emission spectra of LaGaO₃:1%V nanocrystals annealed at 600°C- a), 700°C –b), 800°C- c), 900°C – d), 1000°C and 1100°C –f) measured at the temperature range from -300°C to 150°C.
Fig. S6. The luminescent decay of V$^{5+}$ - a), V$^{4+}$ -b) and V$^{3+}$ ions -c) in LaGaO$_3$:0.1% V nanocrystals annealed at different temperatures.

Fig. S7. The luminescent decay of V$^{5+}$ - a), V$^{4+}$ -b) and V$^{3+}$ ions -c) in LaGaO$_3$:1% V nanocrystals annealed at different temperatures.