

**Structure and Magnetism of the Rh<sup>4+</sup>-containing  
perovskite oxides La<sub>0.5</sub>Sr<sub>0.5</sub>Mn<sub>0.5</sub>Rh<sub>0.5</sub>O<sub>3</sub> and  
La<sub>0.5</sub>Sr<sub>0.5</sub>Fe<sub>0.5</sub>Rh<sub>0.5</sub>O<sub>3</sub>**

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Structure and Magnetism of the Rh<sup>4+</sup>-containing perovskite oxides  
 $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$  and  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$

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Michael A. Hayward\*

Supporting Information

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**Table S1.** Parameters extracted fit to <sup>57</sup>Fe Mössbauer spectrum collected from  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$  in which one doublet is fixed at CS = 0 and one is free to refine ( $\chi^2 = 0.694$ ).

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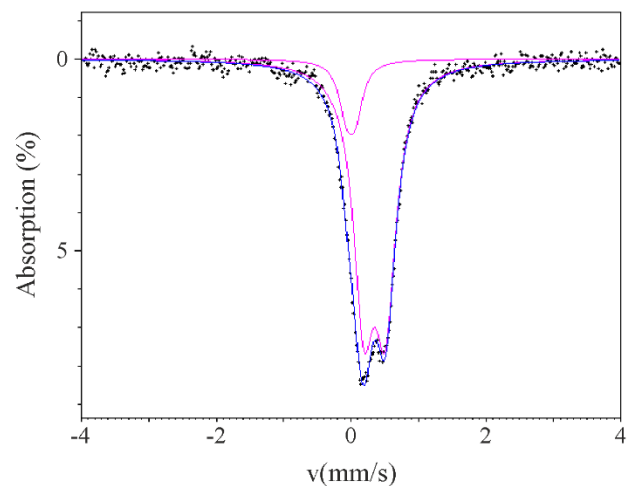
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**Figure S3.** Expanded plot of magnetisation-field isotherm collected from  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$  at 5 K, showing the coercive field of the material is 190 Oe.

## 1. $^{57}\text{Fe}$ Mössbauer Spectra of $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$

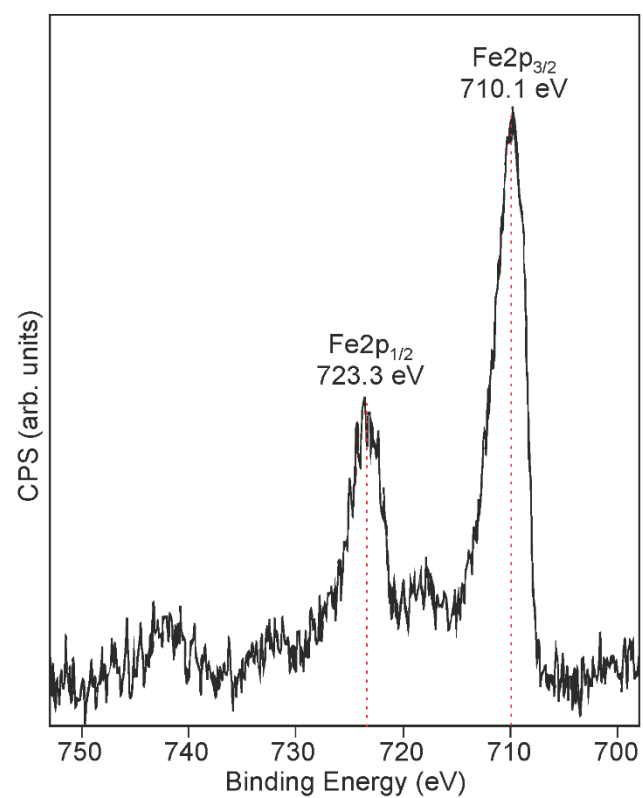


**Figure S1.**  $^{57}\text{Fe}$  Mössbauer spectrum collected from  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$  at room temperature. Fit with one doublet fixed at  $\text{CS} = 0$  and one free to refine.

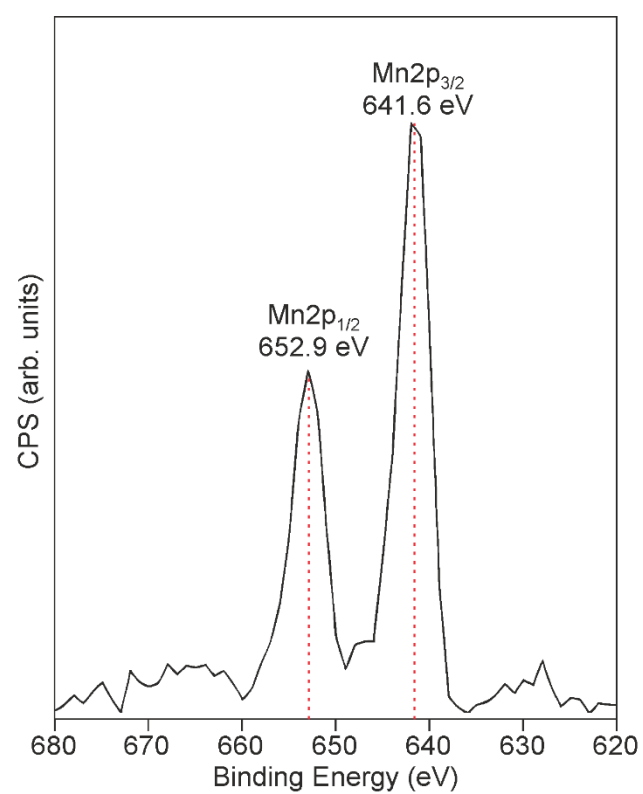
Doublet	CS (mm/s)	$\Delta$ (mm/s)	WHM (mm/s)	Site population (%)
1	0.351(6)	0.323(7)	0.189(6)	88(2)
2	0	0.136(36)	0.132(29)	12(2)

**Table S1.** Parameters extracted fit to  $^{57}\text{Fe}$  Mössbauer spectrum collected from  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$  in which doublet 2 is fixed at  $\text{CS} = 0$  and one is free to refine ( $\chi^2 = 0.694$ ).

## 2. Fe 2P and Mn 2P spectra of $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$ $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$ .

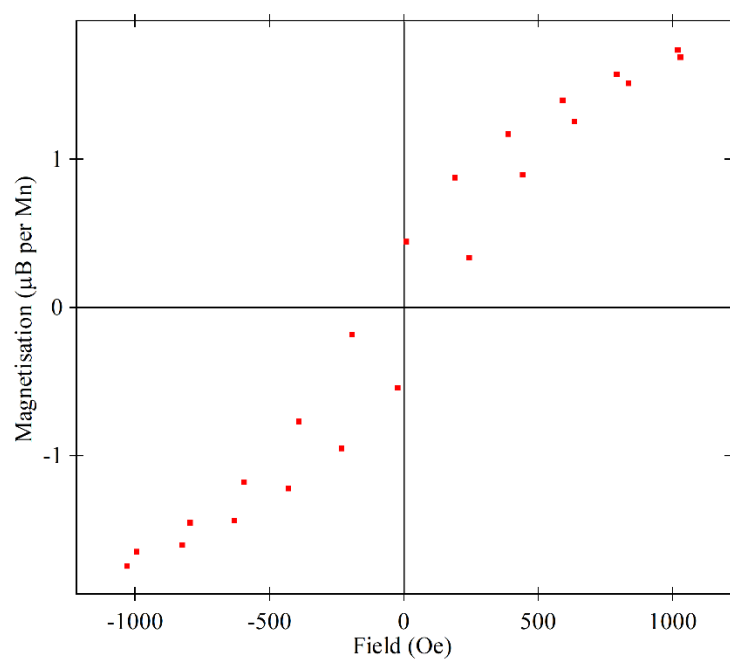


**Figure S2.** Fe 2P spectrum of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.5}\text{Rh}_{0.5}\text{O}_3$ .



**Figure S3.** Mn 2P spectrum of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$ .

### 3. Magnetic behaviour of $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$ .



**Figure S3.** Expanded plot of magnetisation-field isotherm collected from  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Rh}_{0.5}\text{O}_3$  at 5 K, showing the coercive field of the material is 190 Oe.