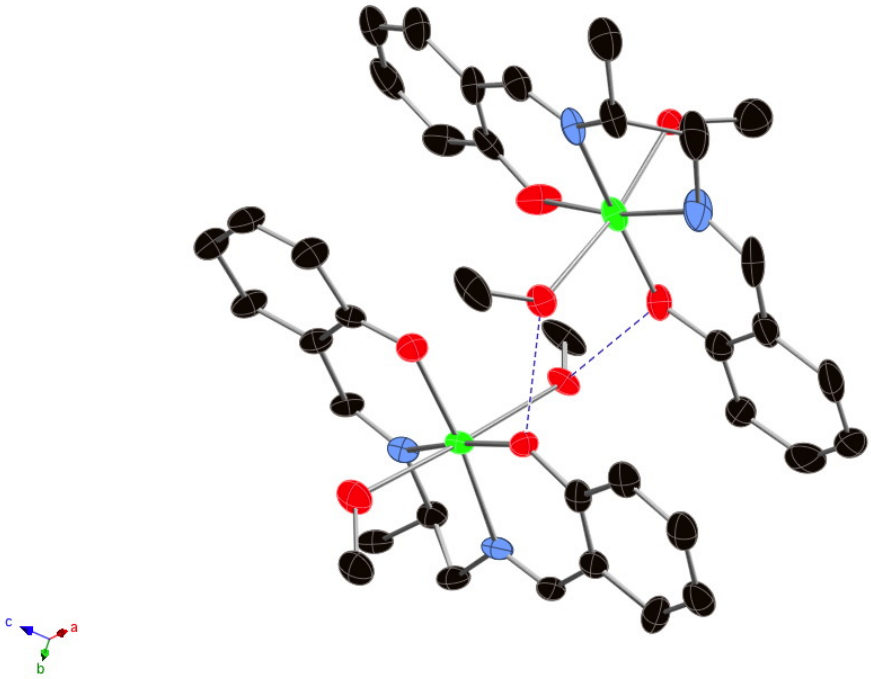

Fig. SI1 Dimer of neighbouring [Mn((*R*)-salmen)$(CH_3OH)_2$]$^+$ complexes linked through hydrogen-bonds in the structure of ***(R)*-2**. Hydrogen-bonds are blue-dashed lines. (Mn (green) C (black), N (blue), O (red)).

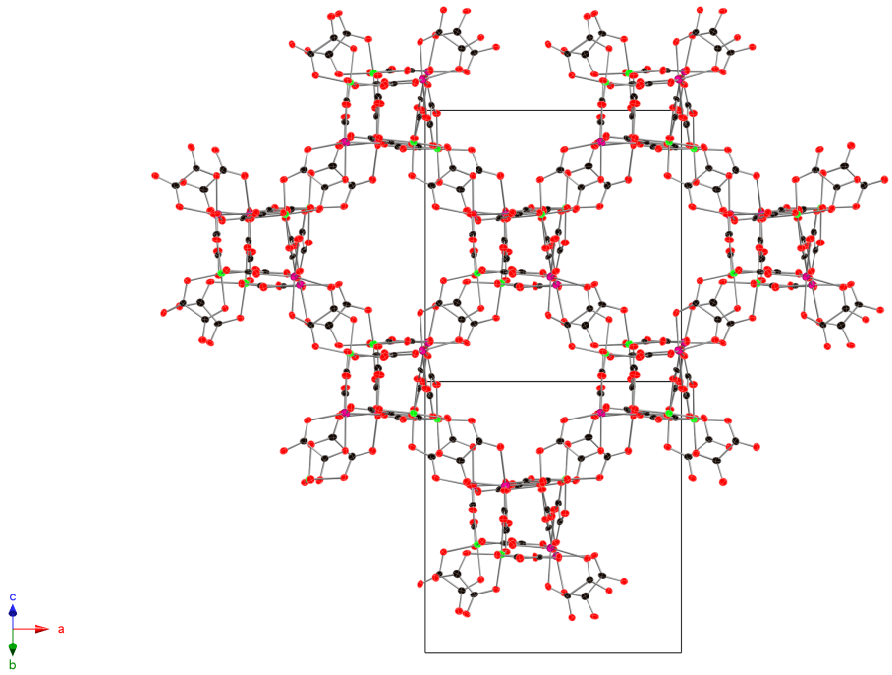

Fig. SI2 Projection of the oxalate network of **3** in the 011 plane. (Cr (pink), Mn (green) C (black), N (blue), O (red)).

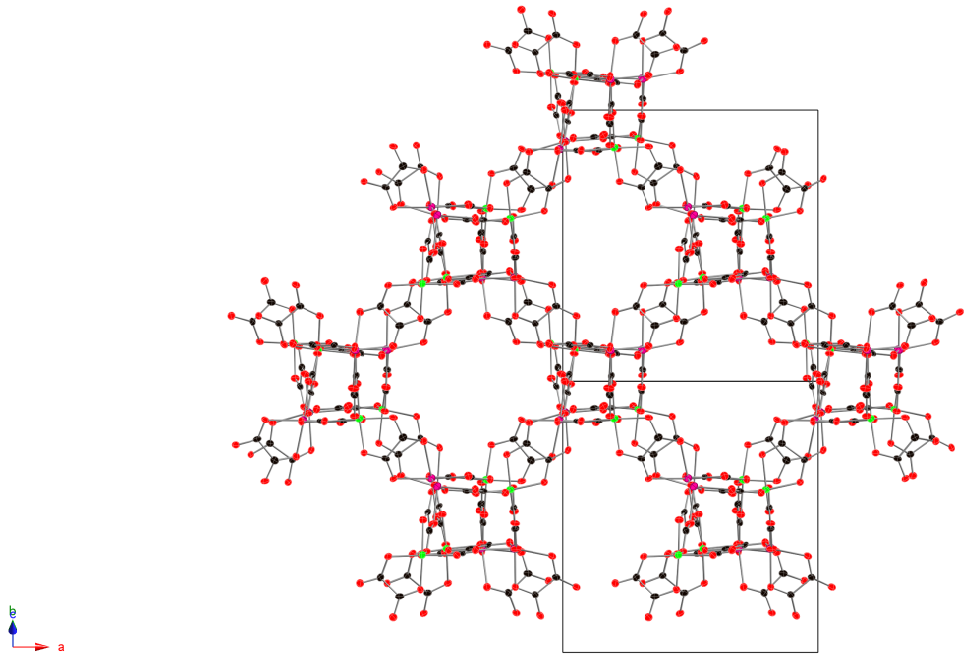

Fig. SI3 Projection of the oxalate network of **3** in the 01-1 plane. (Cr (pink), Mn (green) C (black), N (blue), O (red)).

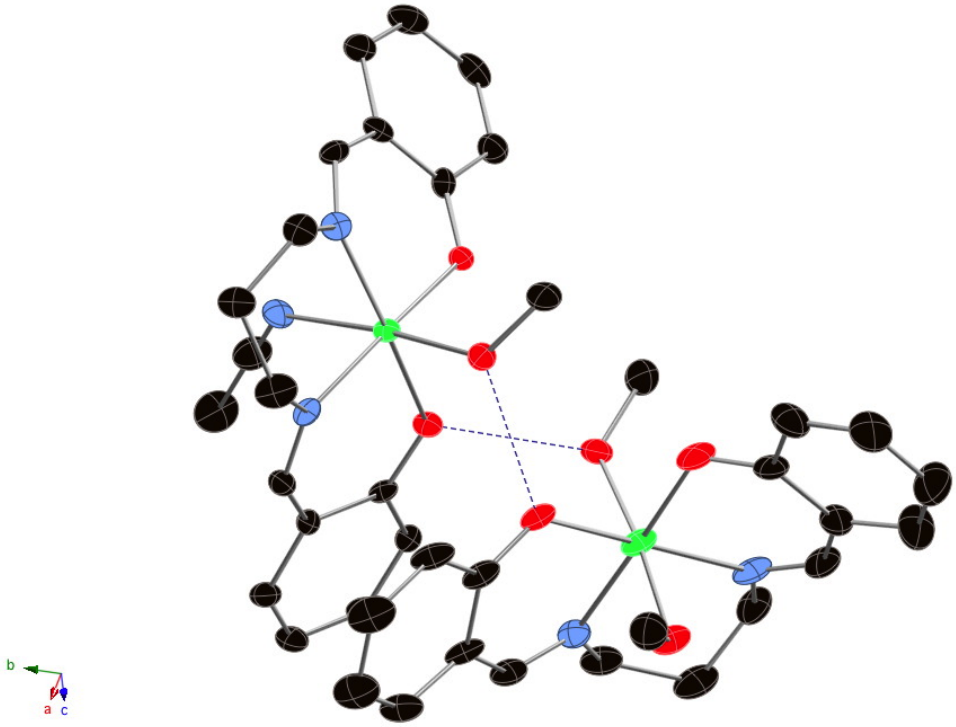

Fig. SI4 Dimer of $[Mn(salpn)(CH_3OH)_2]^+$ and $[Mn(salpn)(CH_3CN)(CH_3OH)]^+$ molecules linked through two hydrogen bonds. Hydrogen-bonds are blue-dashed lines. (Mn (green) C (black), N (blue), O (red)).

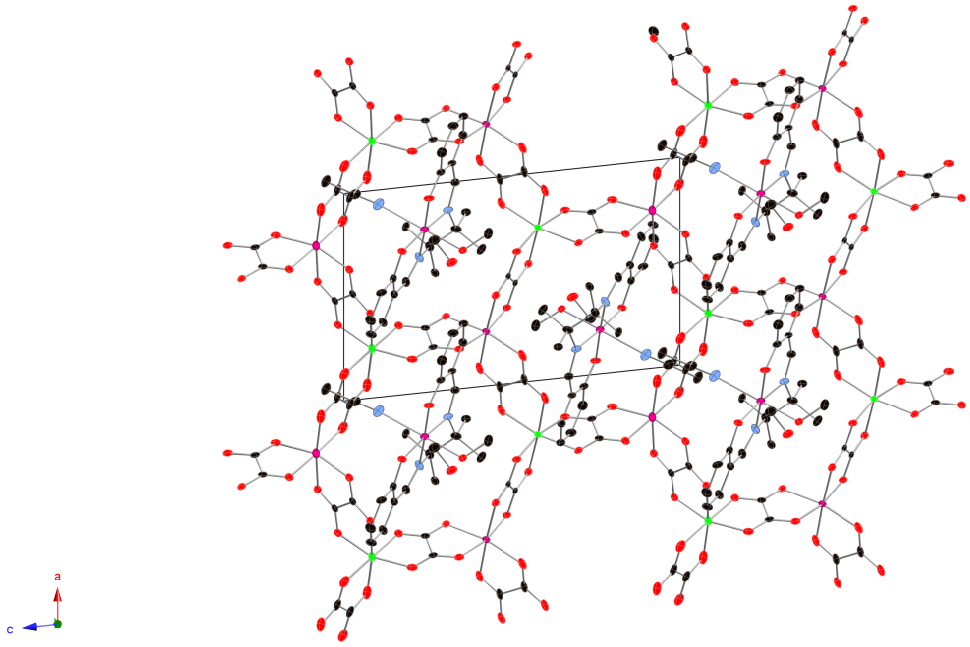

Fig. SI5 Projection of **4** in the *ac* plane. (Cr (pink), Mn (green) C (black), N (blue), O (red)). Hydrogen atoms have been omitted for clarity.

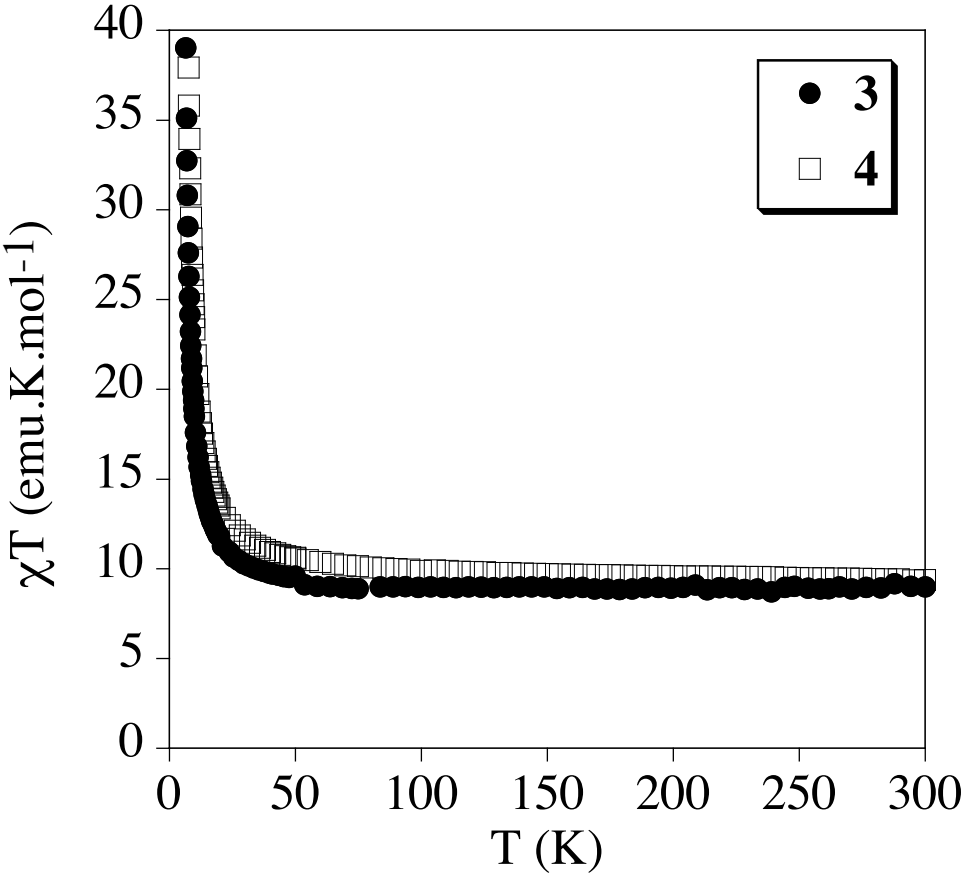

Fig. SI6 Temperature dependence of the product of the molar magnetic susceptibility with temperature (χT) at 0.1 T for compounds **3** (full circles) and **4** (empty circles).

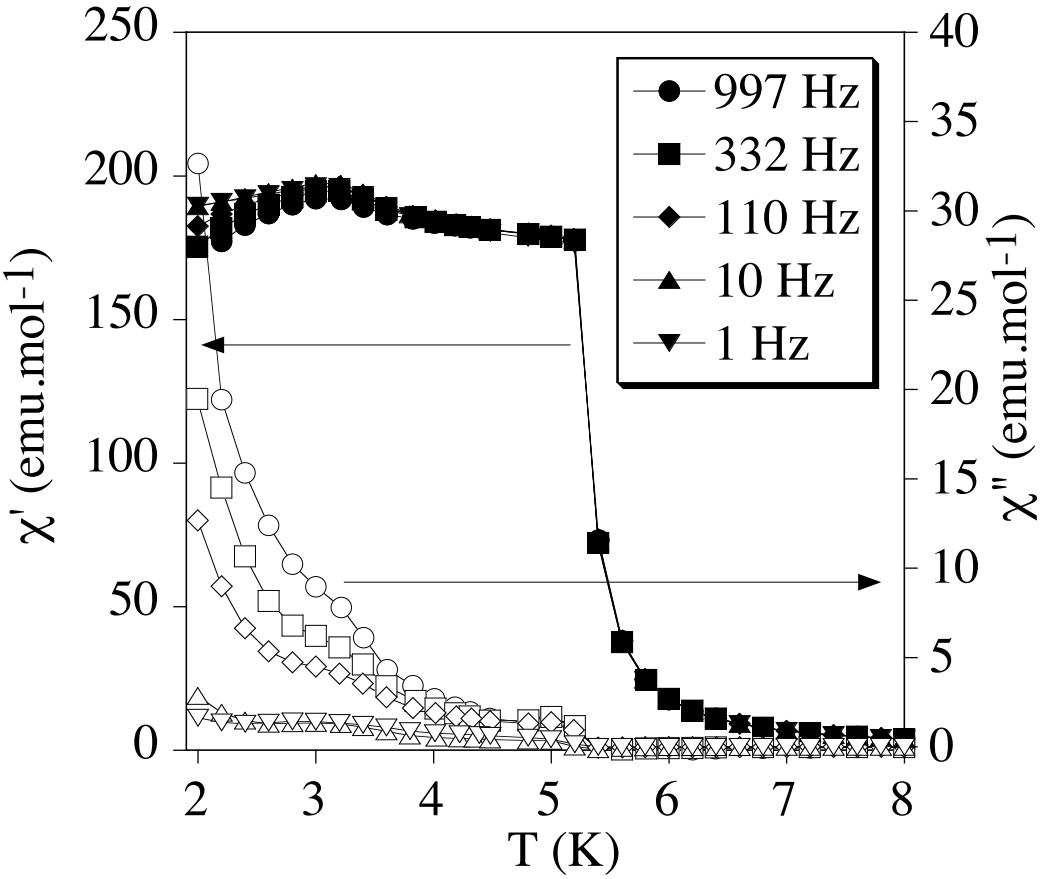

Fig. SI7 Temperature dependence of the in-phase AC susceptibility (χ') (filled symbols) and the out-of-phase AC susceptibility (χ'') (empty symbols) for ***(R)*-2**.

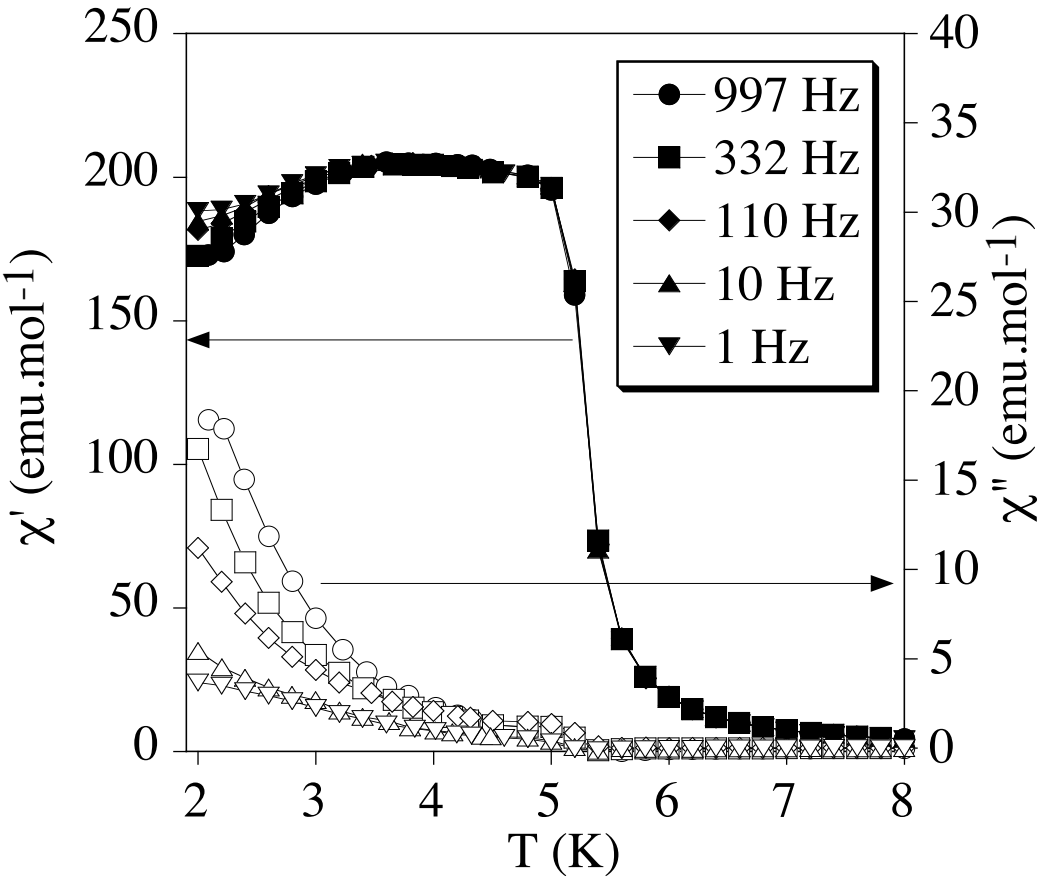

Fig. SI8 Temperature dependence of the in-phase AC susceptibility (χ') (filled symbols) and the out-of-phase AC susceptibility (χ'') (empty symbols) for ***(S)*-2**.

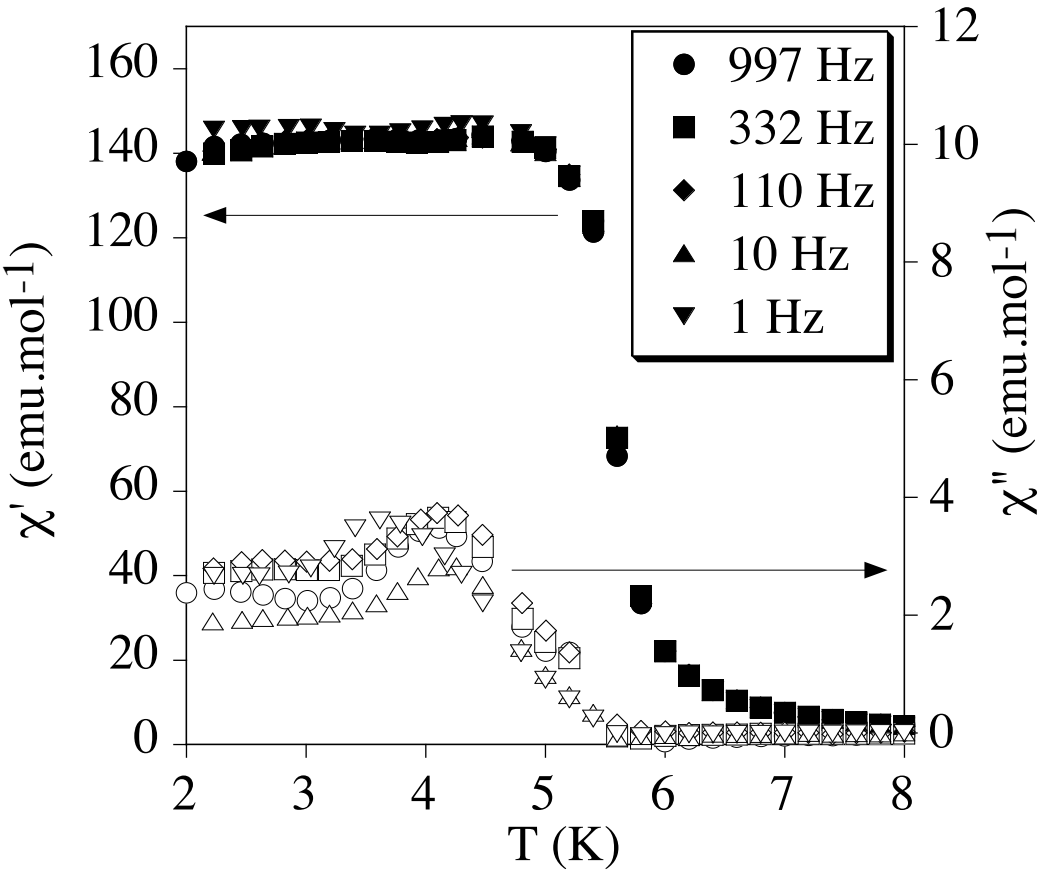

Fig. SI9 Temperature dependence of the in-phase AC susceptibility (χ') (filled symbols) and the out-of-phase AC susceptibility (χ'') (empty symbols) for **3**.

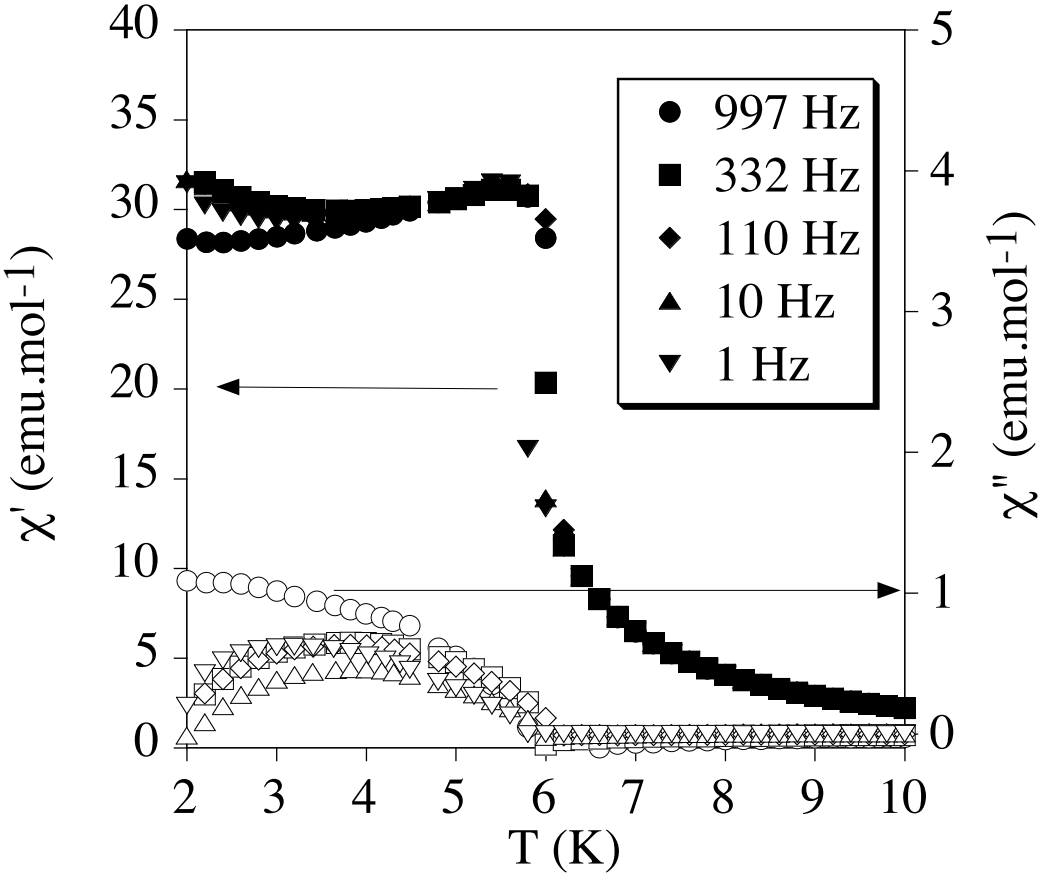

Fig. SI10 Temperature dependence of the in-phase AC susceptibility (χ') (filled symbols) and the out-of-phase AC susceptibility (χ'') (empty symbols) for **4**.

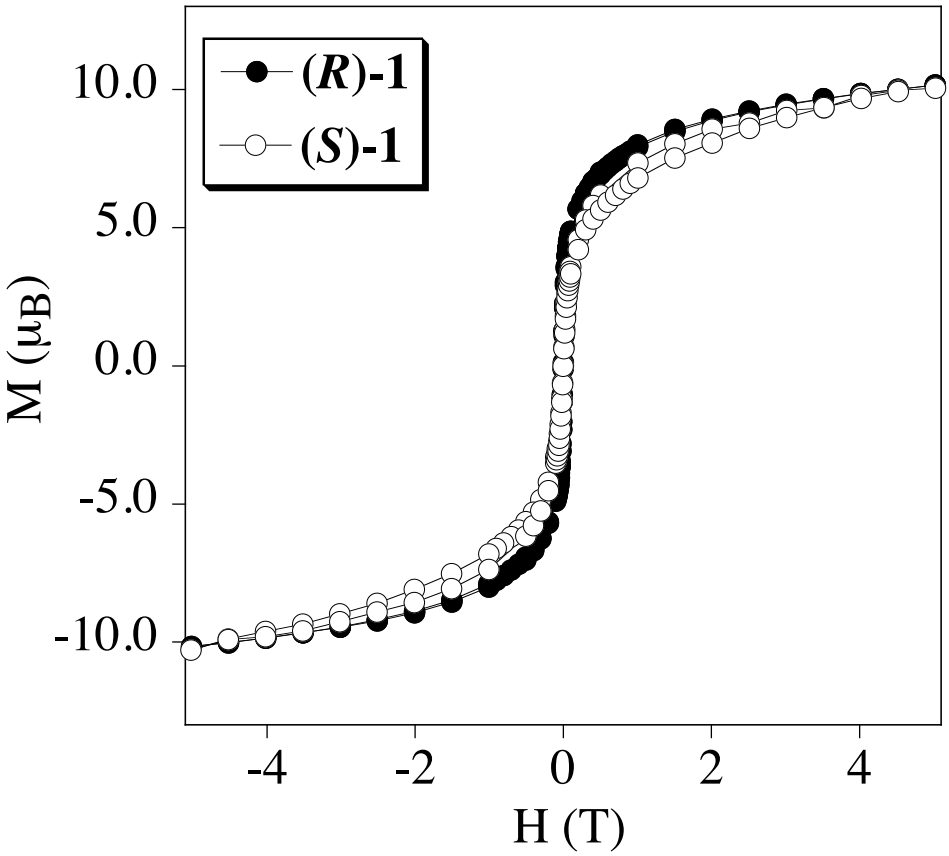

Fig. SI11 Field dependence of the magnetization (M) for compounds ***(R)*-1** (full circles) and ***(S)*-1** (empty circles).

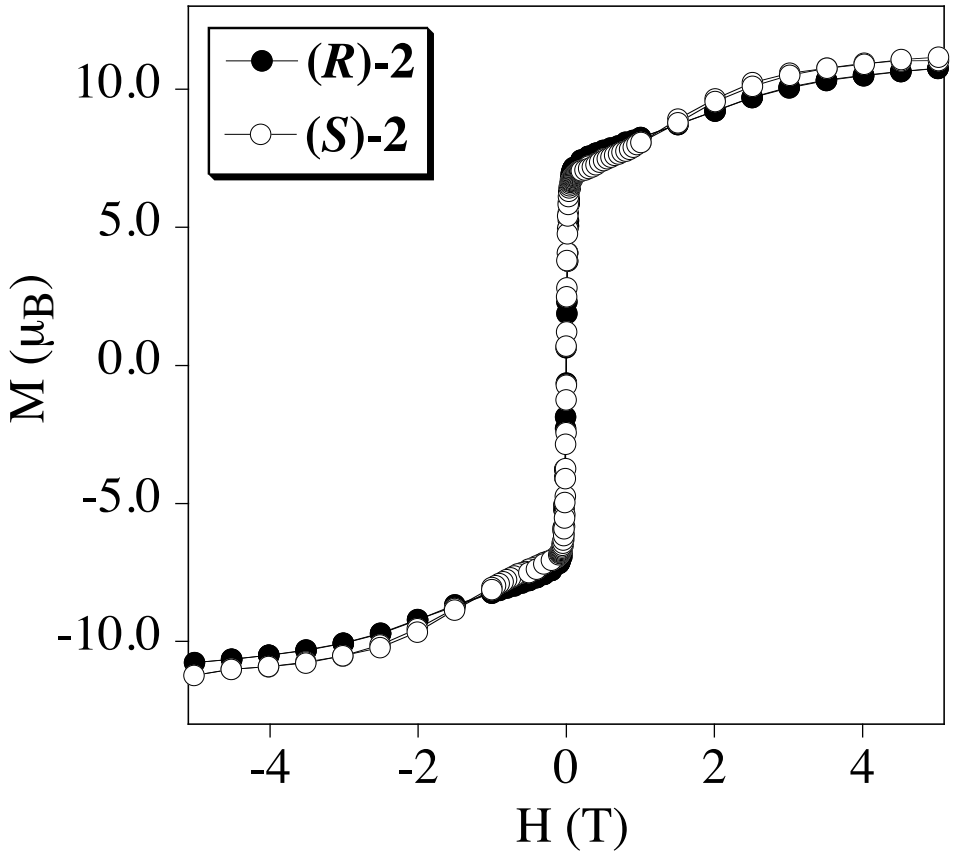

Fig. SI12 Field dependence of the magnetization (M) for compounds ***(R)*-2** (full circles) and ***(S)*-2** (empty circles).

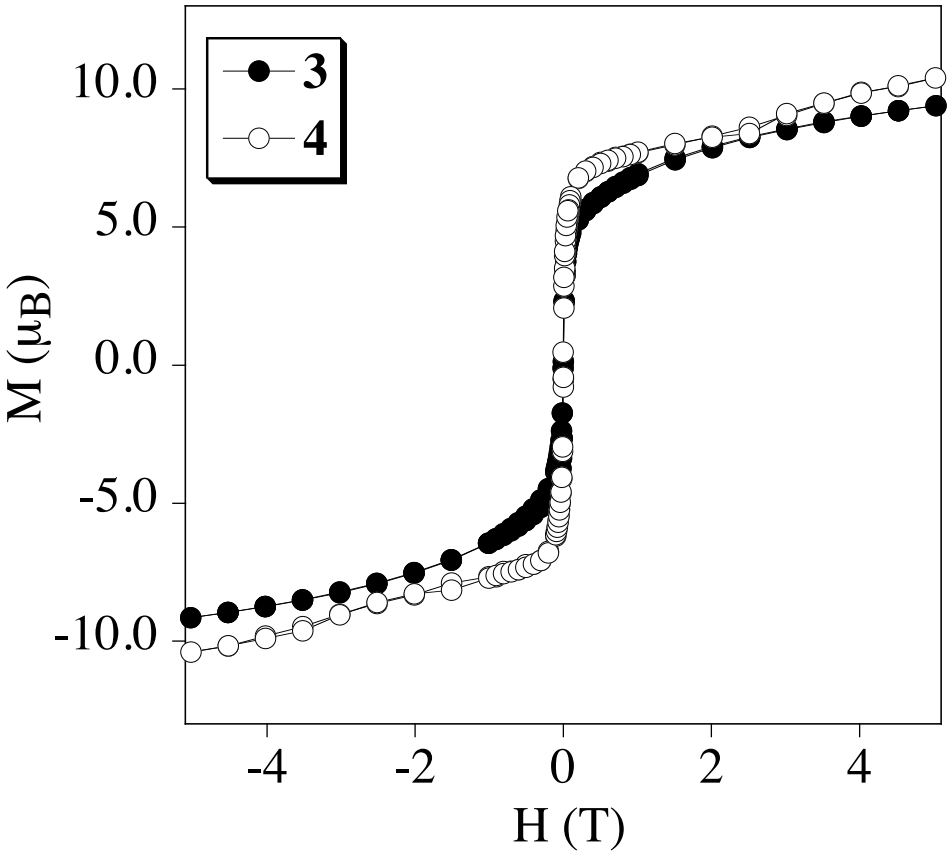

Fig. SI13 Field dependence of the magnetization (M) for compounds **3** (full circles) and **4** (empty circles).