Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

ELECTRONIC SUPPORTING INFORMATION

for

Acoustic Emissions from Spin Crossover Complexes

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The trials to get statistically relevant AE signals on the neat powder of compound **2** were not successful. Thus, the powder was compacted into pellets by pressing (applying 6-7 kN force on about 0.07 cm^2 cross section in a frame). Figure S1 shows an illustration of the AE results on the pellets simultaneously analysed by DSC (similar to Fig. 3 in the main text). It can be seen that there is a similar good correlation between the AE events and the DSC peaks than for compound **1**. Fig. S2 illustrates (similar to Fig. 4 in the main text) the cumulative number of AE events, N_t, and relative transformation heats versus the number of cycles. Again, the trends are similar to those observed for compound **1**. Figure S3 provides examples of power relations for the distributions of energy, amplitude and area (similar to Fig. 5 in the main text) and Table S1 contains the average values of selected power law exponents (similar to Table 1 in the main text). The exponents were the same within the error bars both for heating and for cooling as well as they were independent of the number of cycles. Hence, only their averaged values are given. The exponents are comparable with those obtained for compound **1** within the statistical uncertainty.

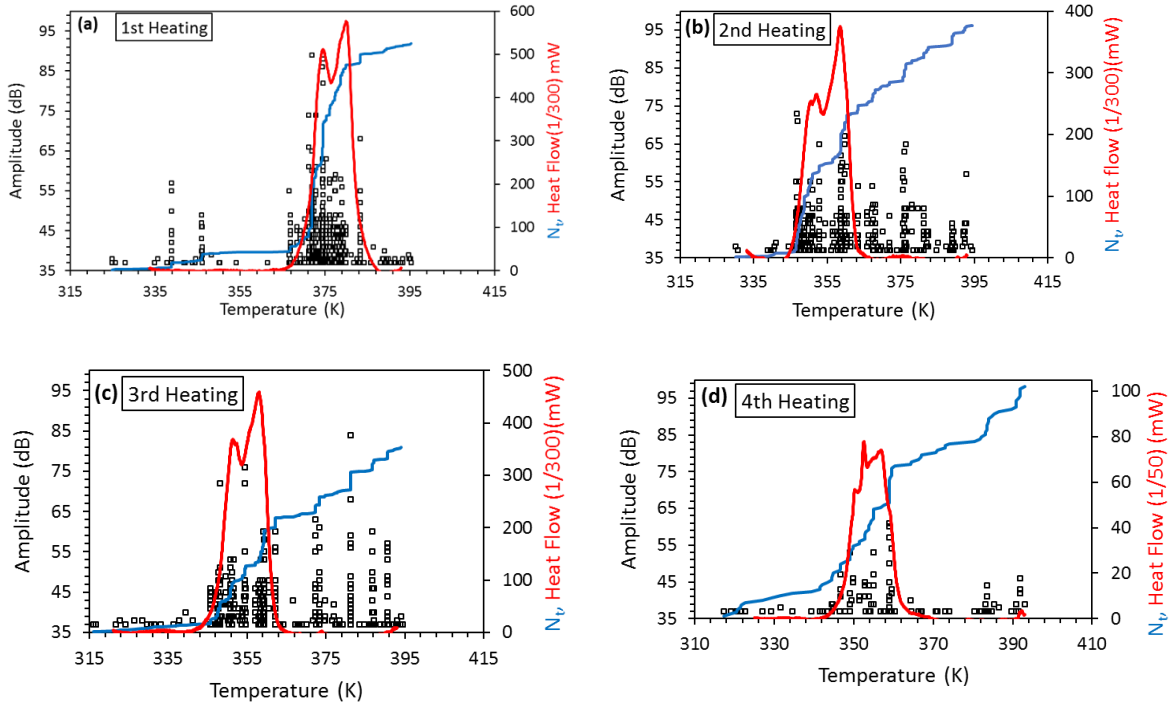

Fig. S1. DSC curves (red lines) and the cumulative number of AE events (Nt=$\sum Ni$, blue lines) for four successive heating runs in compound **2**. Dots indicate the amplitude of individual AE hits. (The numbers on the right hand vertical axis show the values of Nt. The heat flow in mW is given by the same numbers after multiplying by the factor indicated in the brackets.)

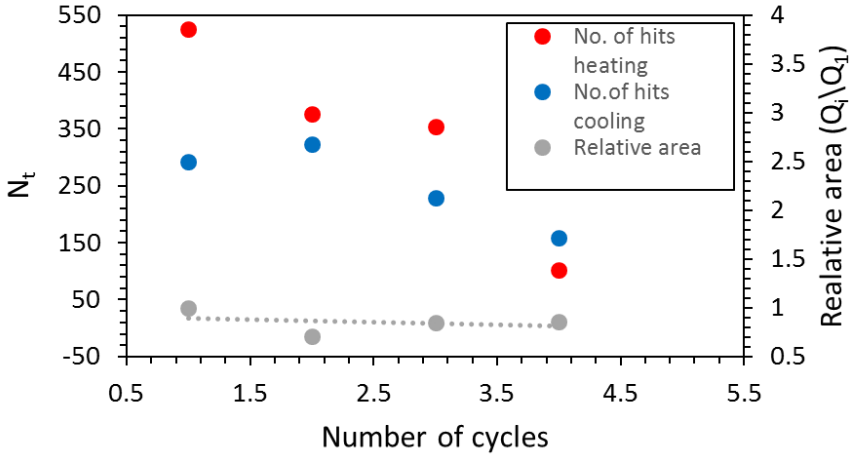

Fig. S2. Number of acoustic events N_t and the relative transformation heats vs. the number of cycles in compound **2**.

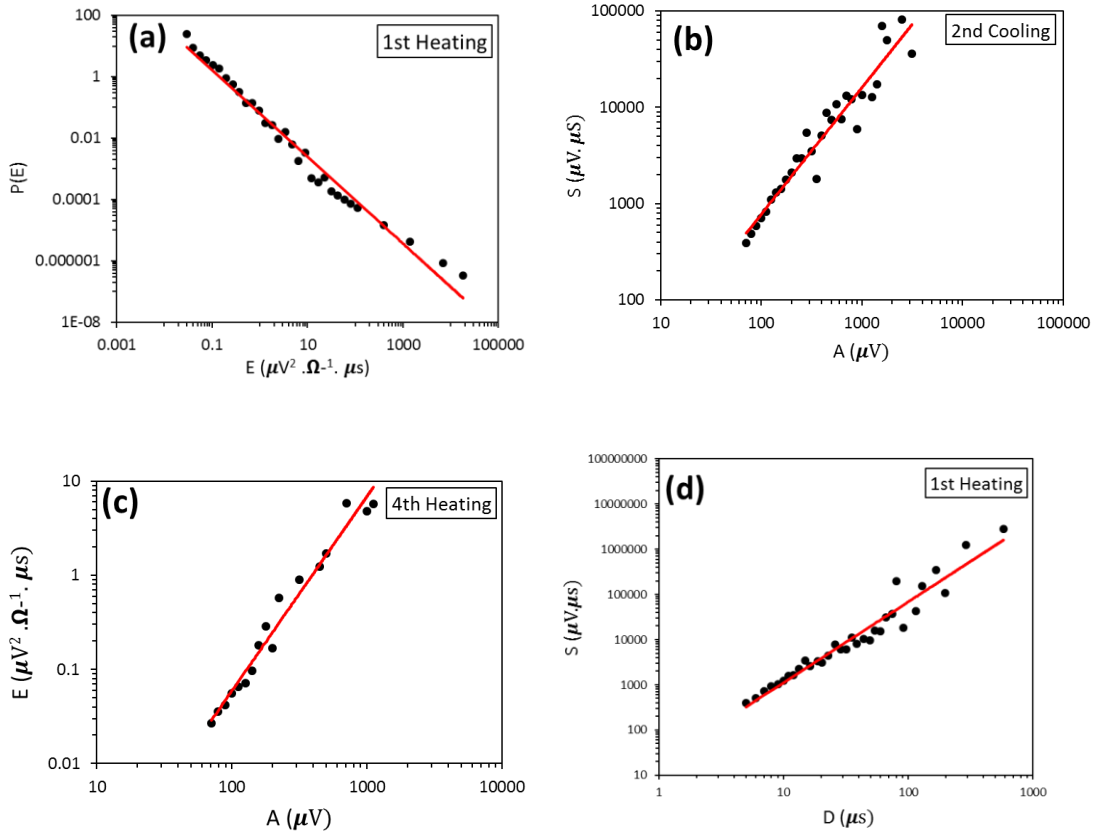

Fig. S3. Illustrations of power relations for compound **2**.

Table S1. Exponent of the probability distribution density function for the AE energy and the power exponents in the energy-amplitude, area-amplitude and area-duration relationships, for compound **2**. The values are averaged over the thermal cycles (both heating and cooling) and the standard deviations are given in parenthesis.

ε	y	x	γ
1.4(1)	2.1(1)	1.3(1)	1.7(1)

It is also recommended to check the reliability of the average values of the PDF fits by the maximum likelihood, ML, analysis[S1,S2] especially if the number of hits is relatively small and the range of the investigated parameter (A,E or S) covers a relatively narrow interval (about one order of magnitude or even less). Since in the main text for compound **1** we gave the average values of the exponents for six runs (and the error bars represented the scatter ot the results of the individual runs), we created a common PDF using all data collected during the six runs and thus we can compare the exponents obtained from these new PDF fits and from the ML analysis. Fig. S4 shows the pairs of such fits for heating and Table S2 provides the summary of the results. It can be seen that these values are a bit systematically larger than those given in the main text, and agree with each other within the error bars of ML fits, values of the PDF fits of the two averaging would also agree with each other if the error bar of τ would be larger $\Delta\tau = \pm 0.1$ instead of $\Delta\tau = \pm 0.2$) as well as.

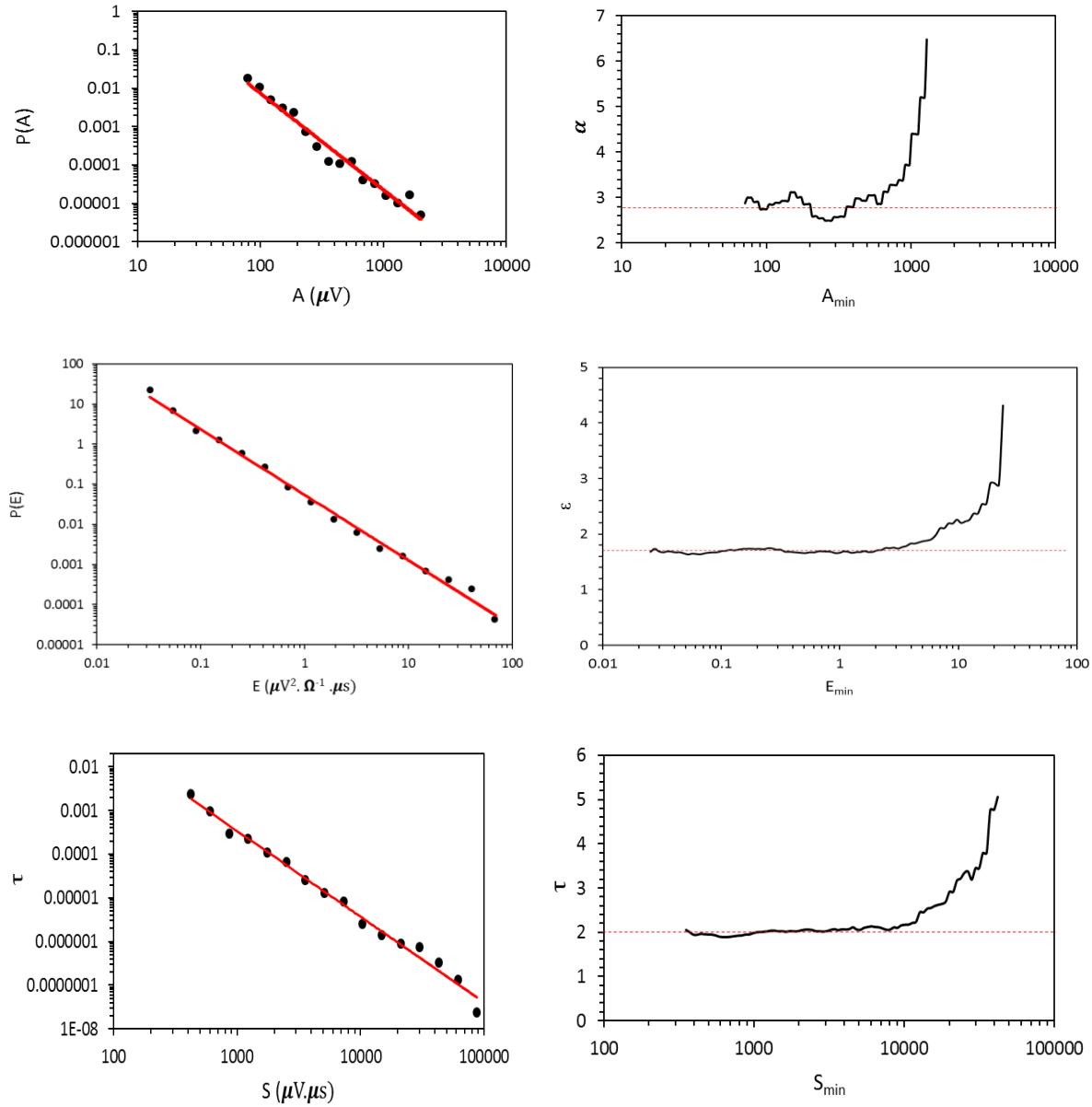

Fig. S4. Comparison of PDF2 fits (left side) and the result of ML analysis (right side) for amplitude, energy and area using all hits collected during the six heating runs for compound **1**.

Table S2. Power exponents obtained from the new PDF (PDF2) and ML analysis using all hits collected during the six heating runs for compound **1** in the heating mode. The error bars in the third column show the limits within the plateau regions. For comparison, the average values obtained from the PDF analysis of individual heating ramps are also shown (PDF1).

	PDF1	PDF2	ML
α	2.3 (2)	2.5	2.8 (3)
ε	1.5 (1)	1.6	1.7 (1)
τ	1.8 (1)	2.0	2.0 (1)

S1. A. Clauset, C.R. Shalizi, M.E. Newman, SIAM Rev. 51 (2009) 661–703.

S2. E.K.H. Salje, A. Planes, E. Vives, Phys. Rev. E **2017**, 96, 042122.