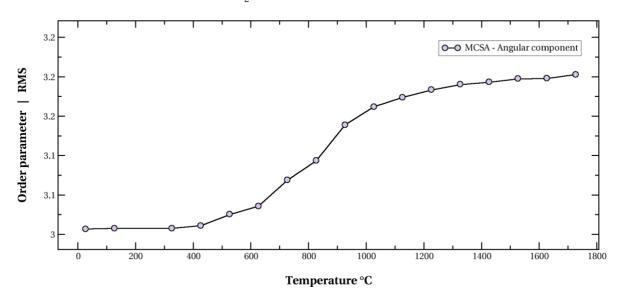
Electronic supplementary information (ESI)

## Modelling of high-temperature order-disorder phase transitions of non-stoichiometric Mo<sub>2</sub>C and Ti<sub>2</sub>C from first principles

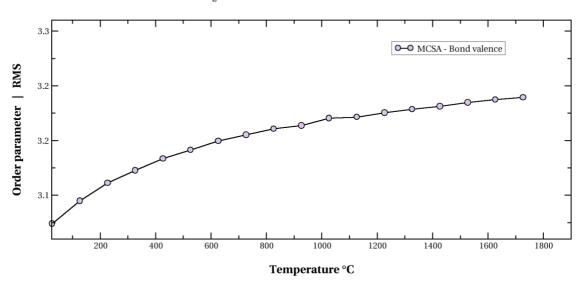
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MCSA for Mo<sub>2</sub>C exploring only the angular component

Figure S1. Monte Carlo simulated annealing (MCSA) using only the angular component contribution for  $Mo_2C$ .



MCSA for Mo<sub>2</sub>C exploring only the bond valence component

Figure S2. Monte Carlo simulated annealing (MCSA) using only the bond valence component contribution for  $Mo_2C$ .

MCSA for  $Mo_2C$  exploring only the  $C^2$  component

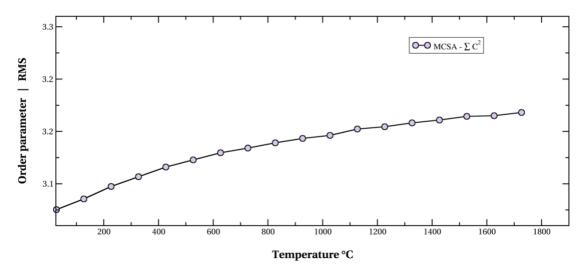


Figure S3. Monte Carlo simulated annealing (MCSA) using only the  $C^2$  summation component contribution for  $Mo_2C$ .