Electrochemical Behaviour of Nd–Fe–B and Sm–Fe–N Polymer-Bonded Magnets and Their Metal Components In Various Electrolytes

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Supplementary Materials

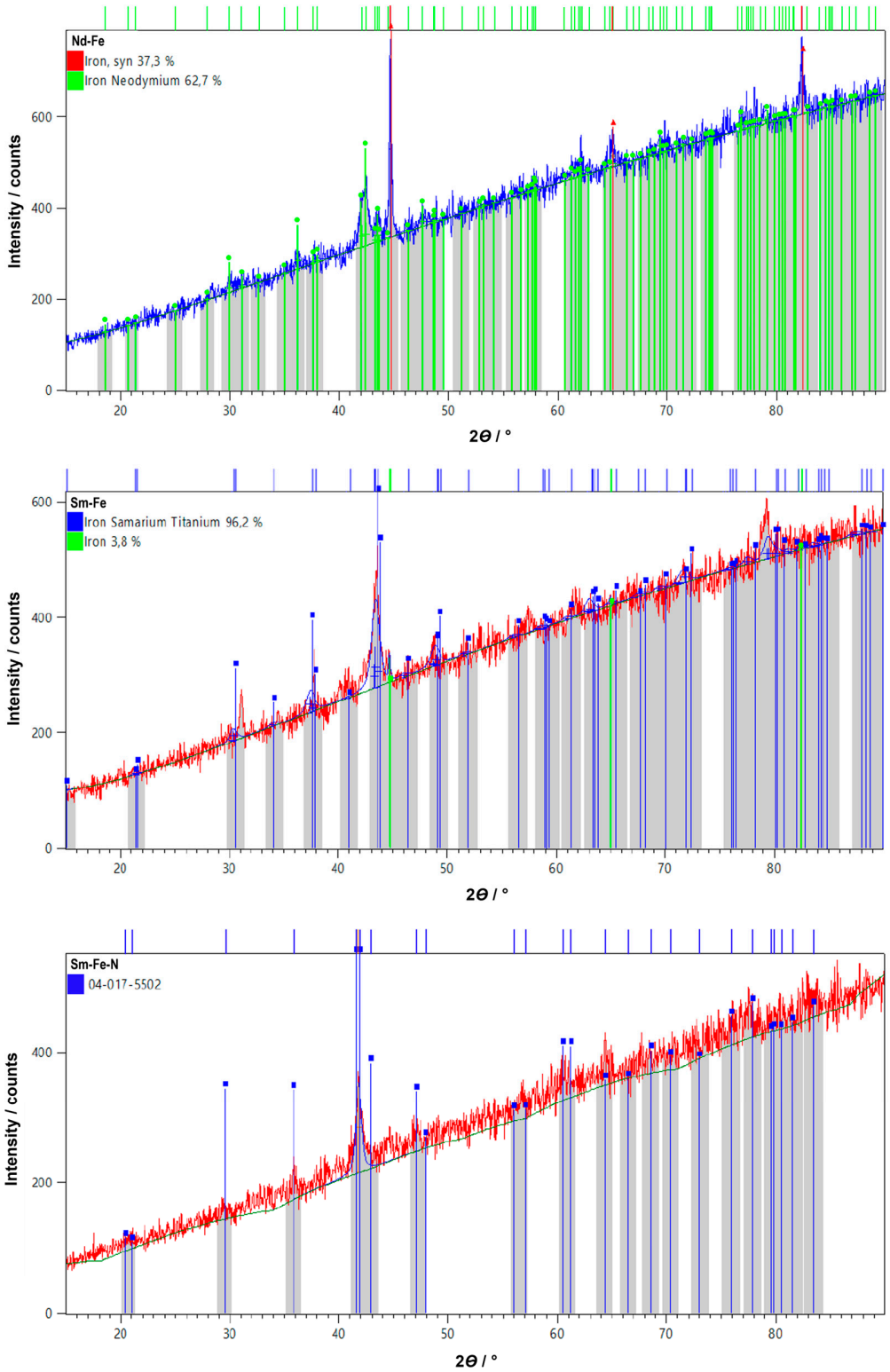


Figure S1. XRD diffractograms with marked phases for the Nd–Fe and Sm–Fe alloys, and the Sm–Fe–N polymer-bonded magnet.

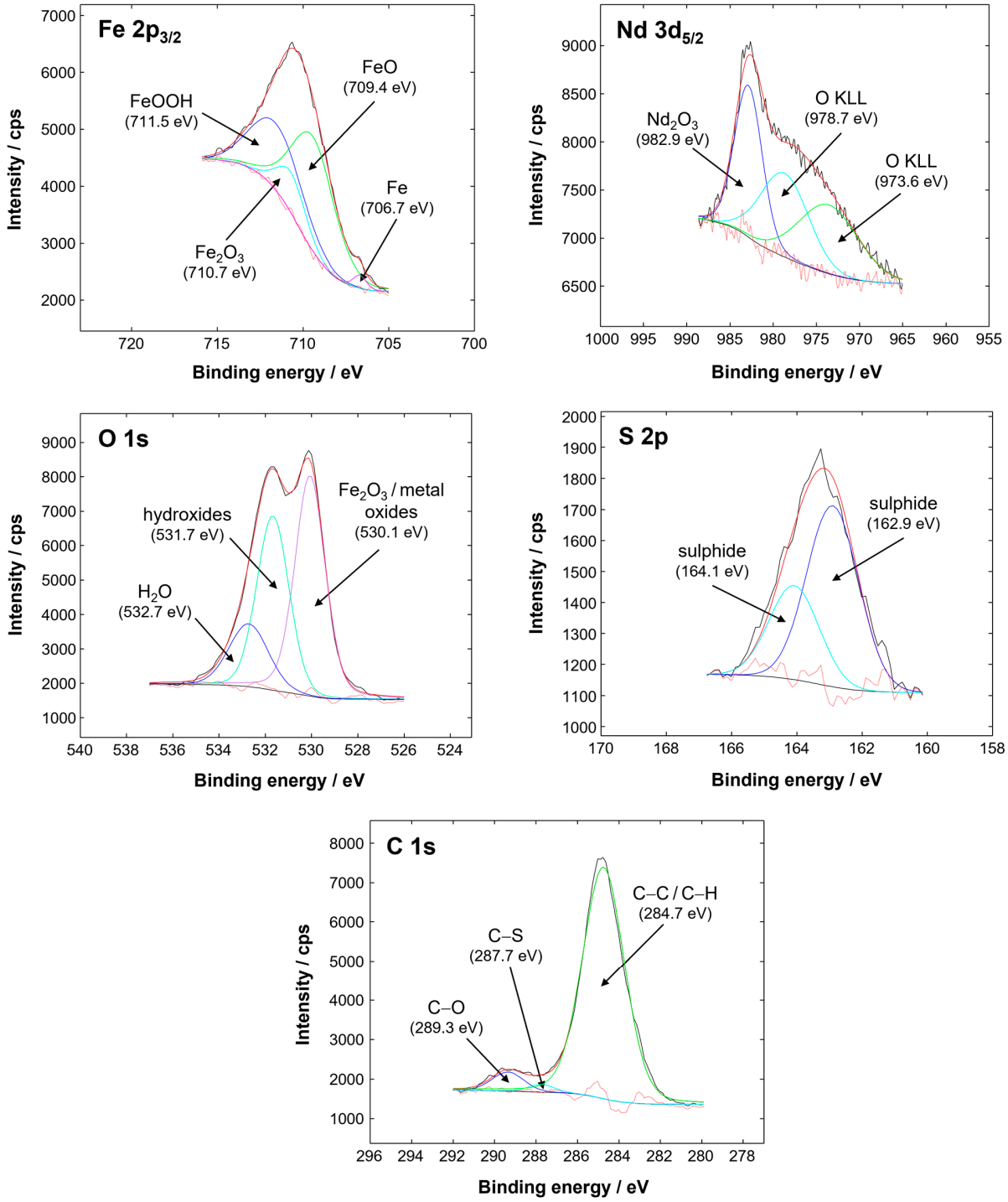


Figure S2. Deconvoluted high-resolution XPS spectra of Fe 2p3/2, Nd 3d5/2, O 1s, S 2p, and C 1s from the Nd–Fe–B polymer-bonded magnet (reference sample).

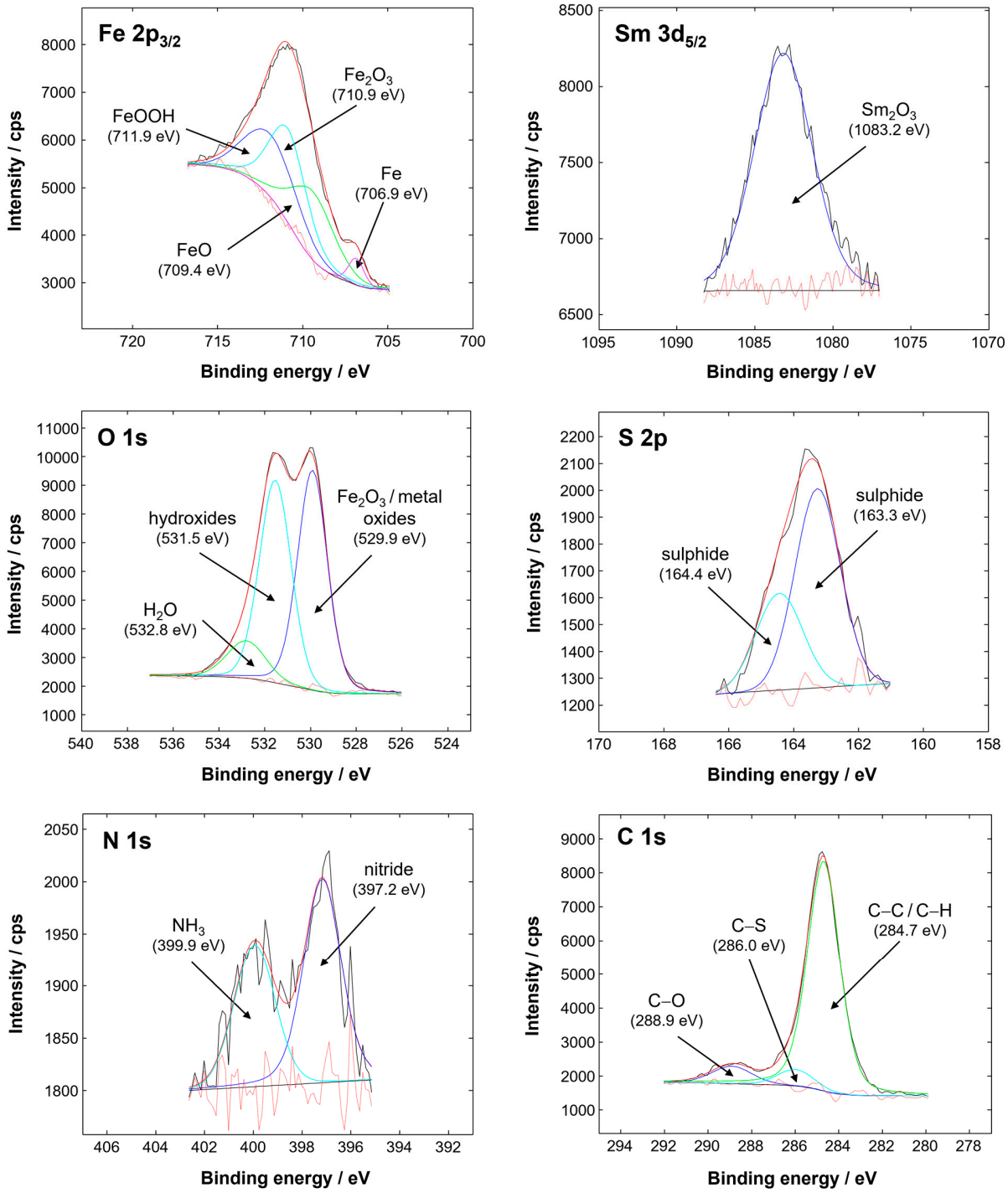


Figure S3. Deconvoluted high-resolution XPS spectra of Fe 2p$_{3/2}$, Sm 3d$_{5/2}$, O 1s, S 2p, N 1s, and C 1s from the Sm–Fe–N polymer-bonded magnet (reference sample).

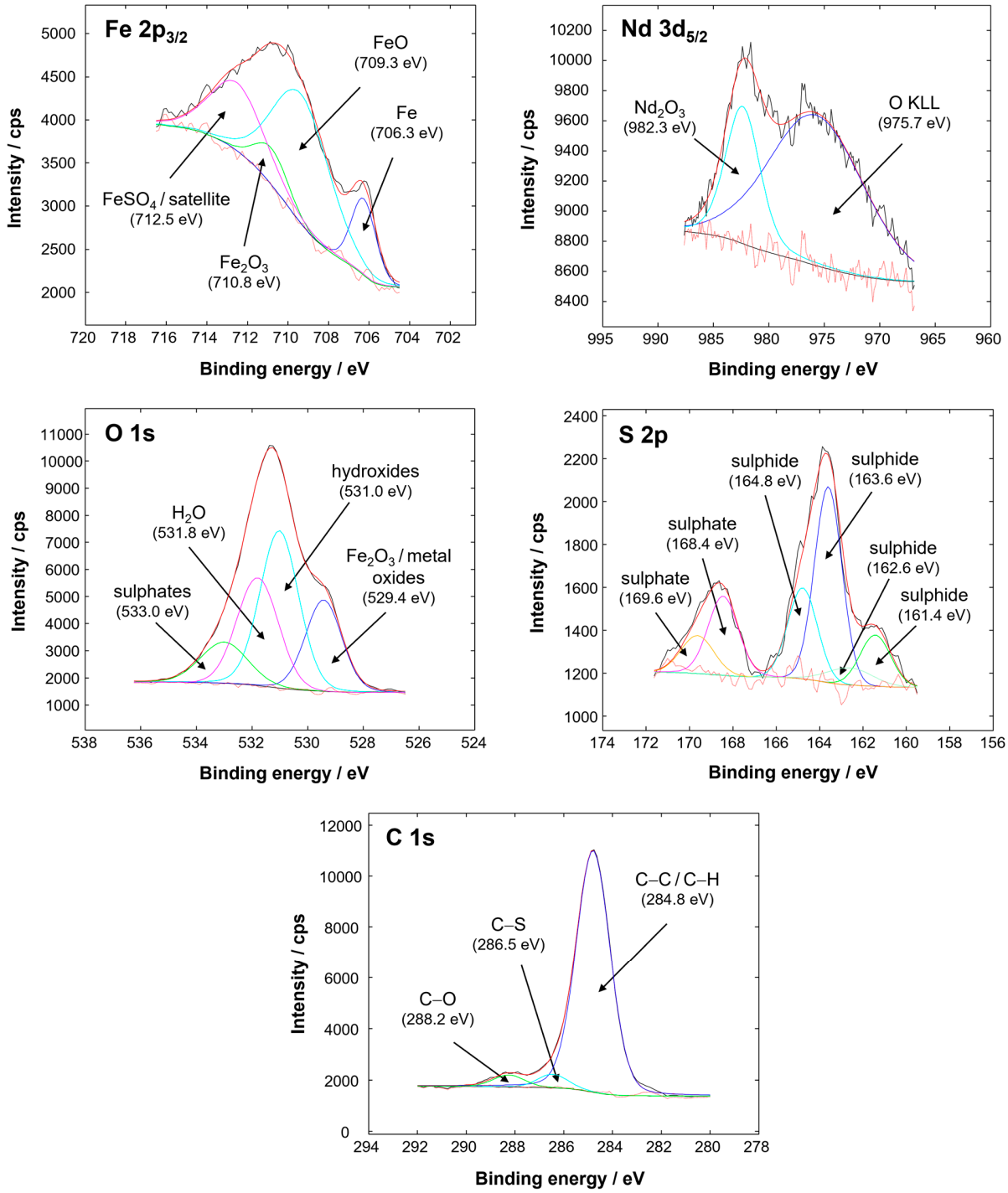


Figure S4. Deconvoluted high-resolution XPS spectra of Fe $2p_{3/2}$, Nd $3d_{5/2}$, O 1s, S 2p, and C 1s from the Nd–Fe–B polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.01 M H_2SO_4 electrolyte at room temperature.

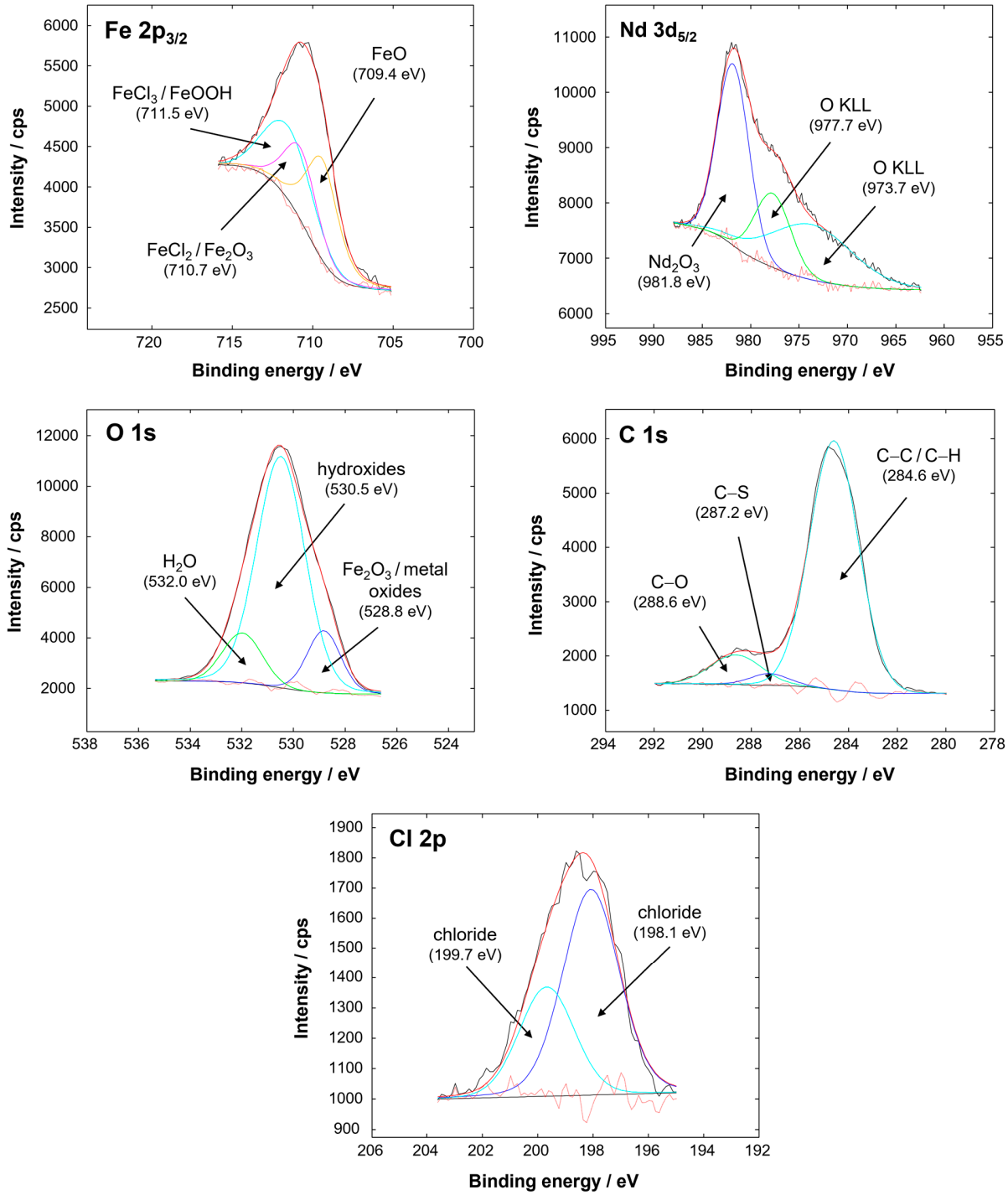


Figure S5. Deconvoluted high-resolution XPS spectra of Fe 2p3/2, Nd 3d5/2, O 1s, C 1s, and Cl 2p from the Nd–Fe–B polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.1 M NaCl electrolyte at room temperature.

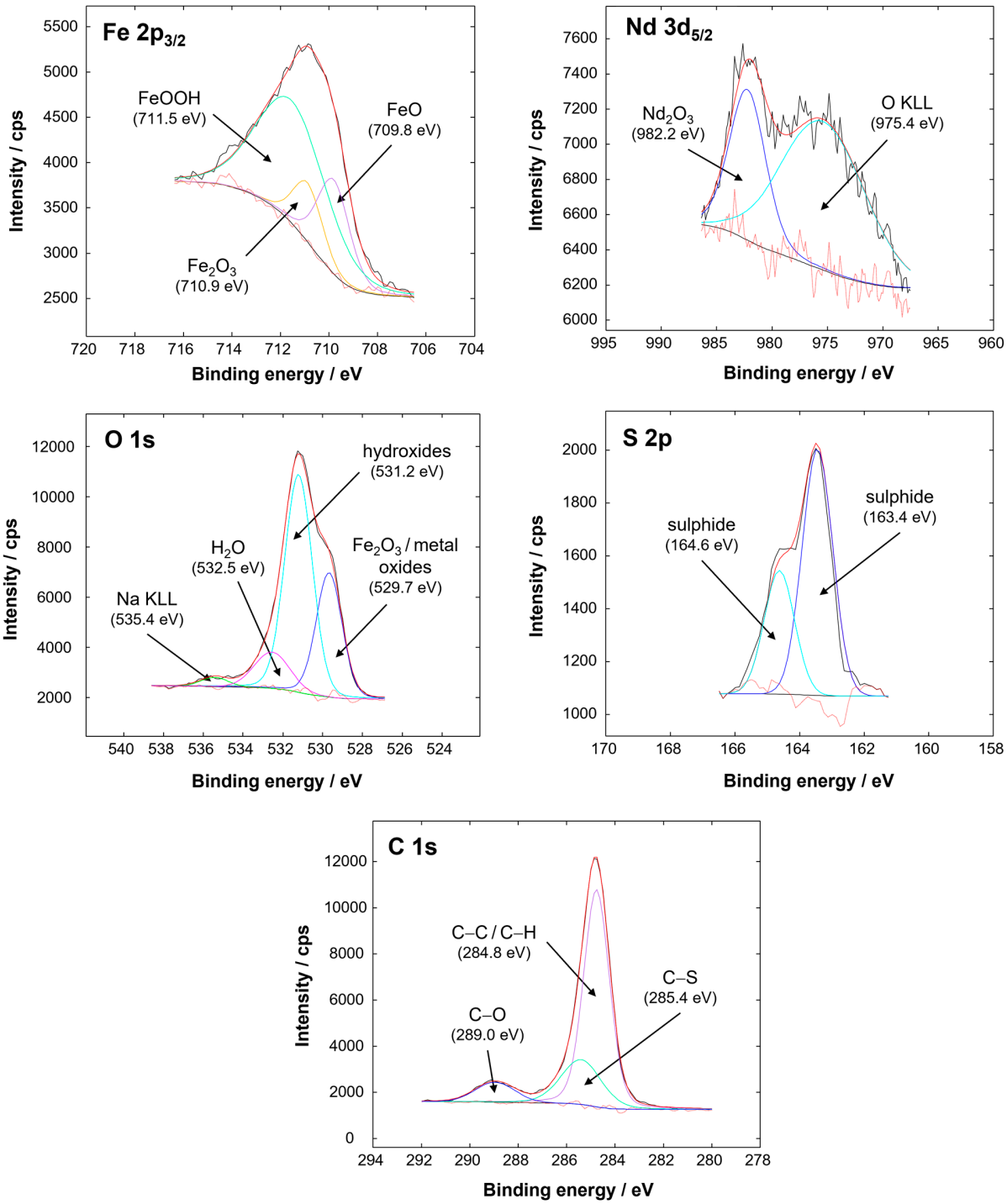


Figure S6. Deconvoluted high-resolution XPS spectra of Fe 2p3/2, Nd 3d5/2, O 1s, S 2p, and C 1s from the Nd–Fe–B polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.1 M NaOH electrolyte at room temperature.

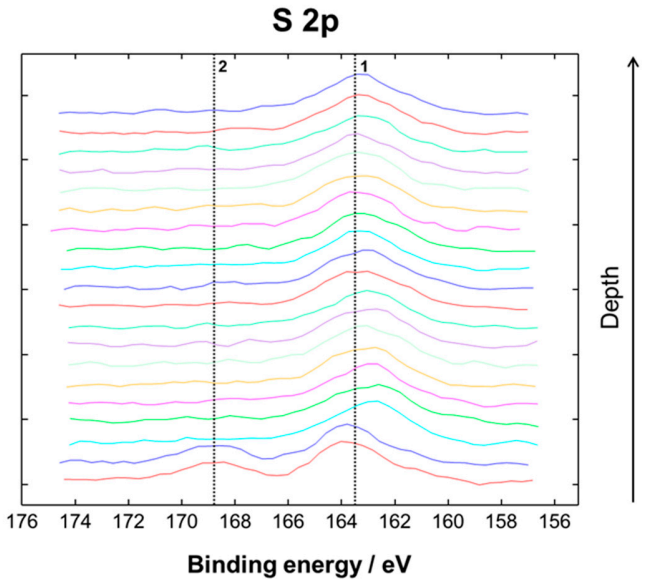


Figure S7. XPS high-resolution spectra of S 2p from the Nd–Fe–B polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.01 M H_2SO_4 electrolyte at room temperature, depending on the sputtering time, i.e., depth.

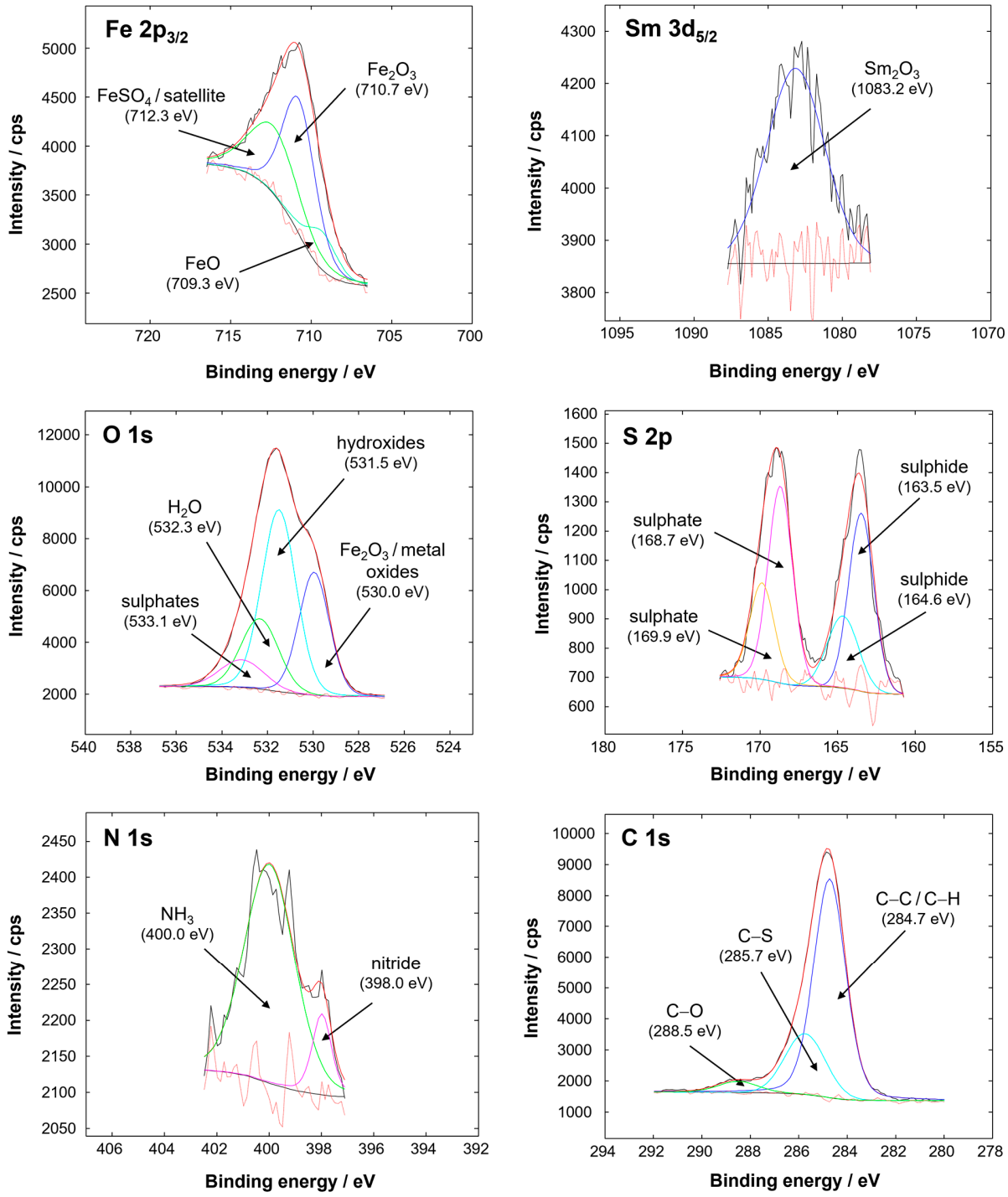


Figure S8. Deconvoluted high-resolution XPS spectra of Fe $2p_{3/2}$, Sm $3d_{5/2}$, O 1s, S 2p, N 1s, and C 1s from the Sm–Fe–N polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.01 M H_2SO_4 electrolyte at room temperature.

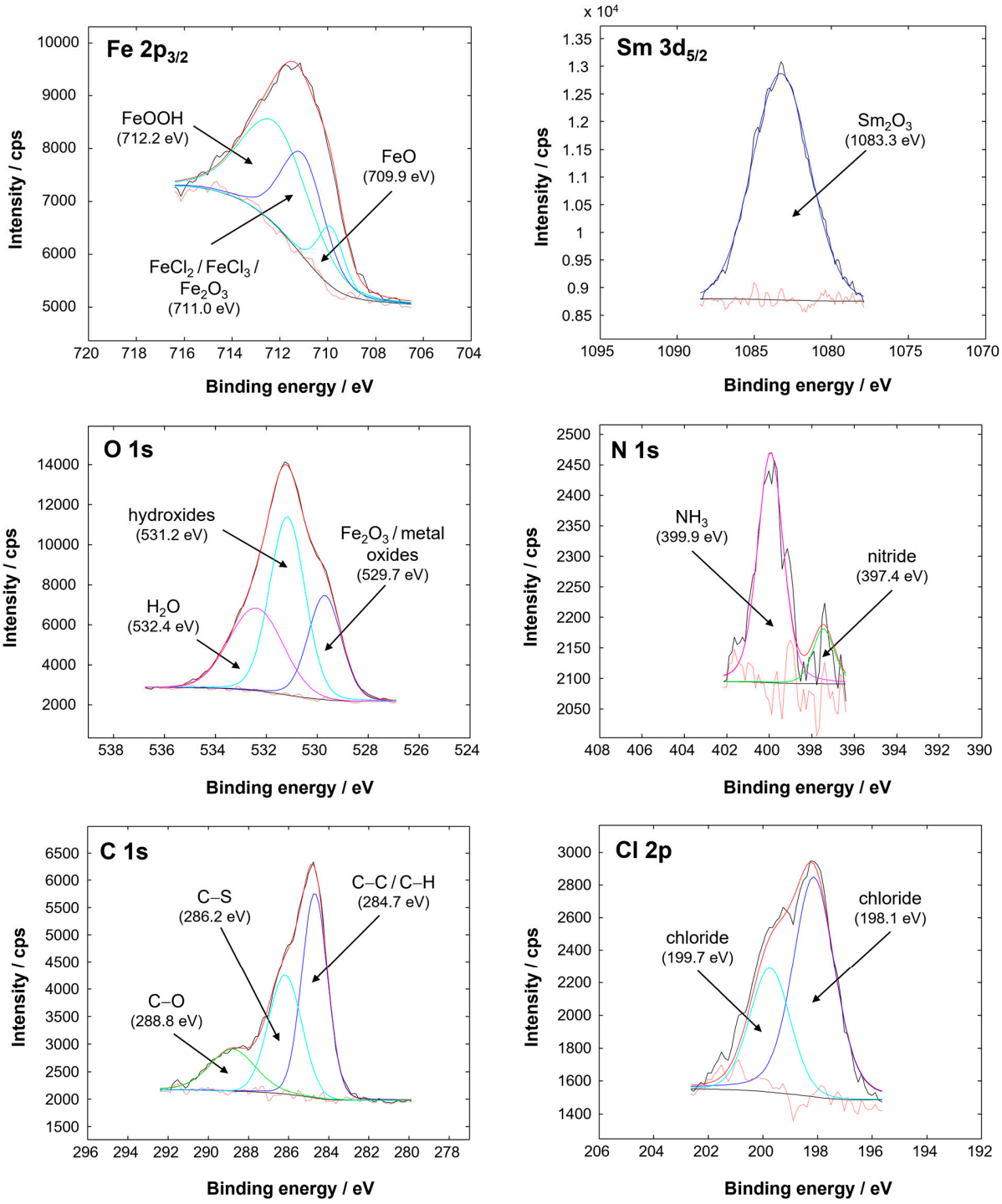


Figure S9. Deconvoluted high-resolution XPS spectra of Fe $2p_{3/2}$, Sm $3d_{5/2}$, O 1s, N 1s, C 1s, and Cl 2p from the Sm–Fe–N polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.1 M NaCl electrolyte at room temperature.

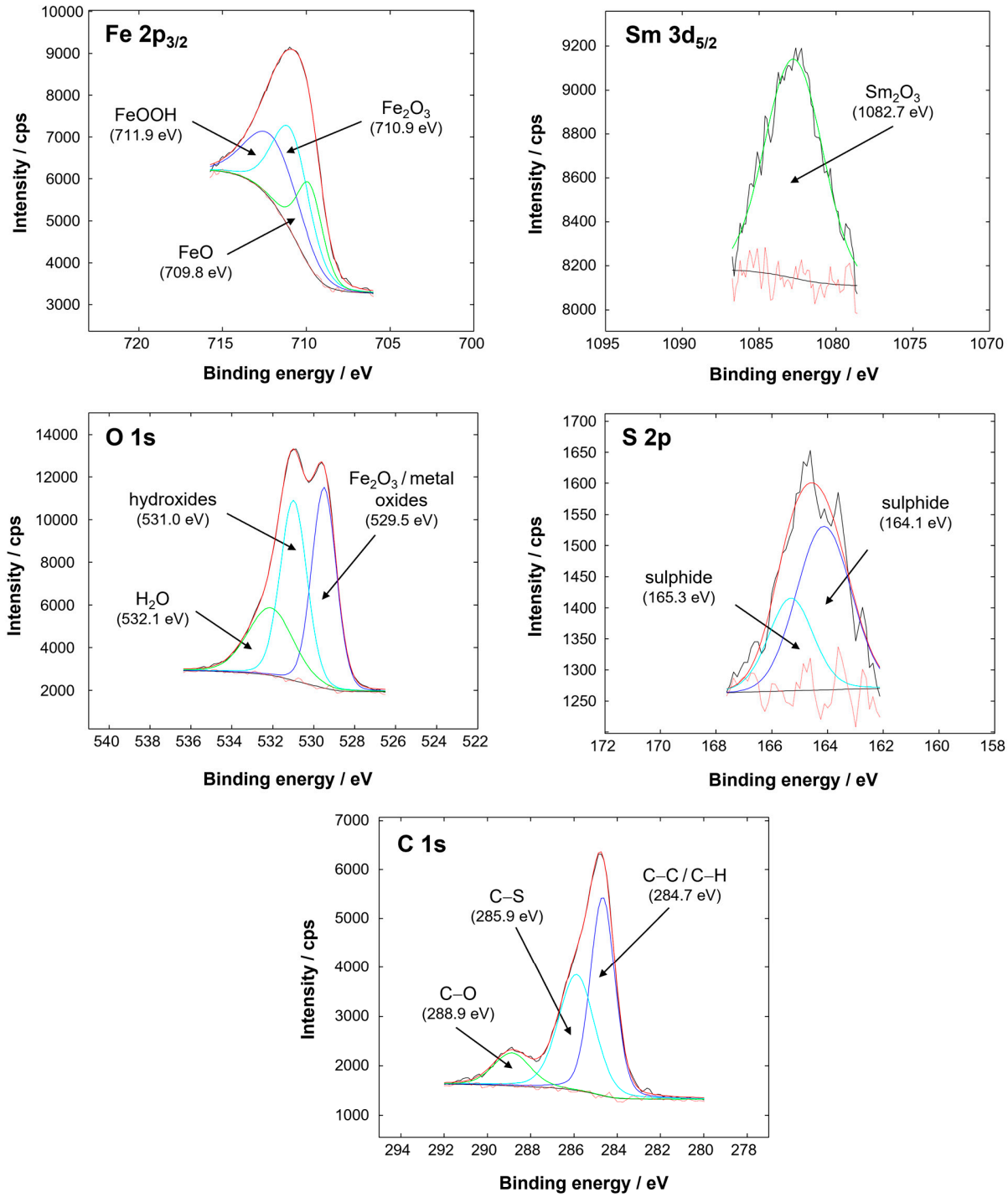


Figure S10. Deconvoluted high-resolution XPS spectra of Fe $2p_{3/2}$, Sm $3d_{5/2}$, O 1s, S 2p, and C 1s from the Sm–Fe–N polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.1 M NaOH electrolyte at room temperature.

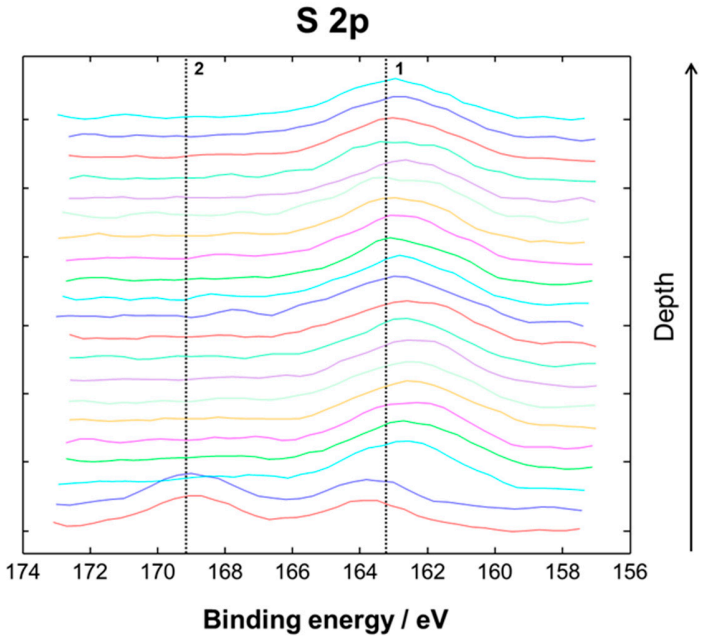


Figure S11. XPS high-resolution spectra of S 2p from the Sm–Fe–N polymer-bonded magnet after the potentiodynamic polarisation measurements in the 0.01 M H_2SO_4 electrolyte at room temperature, depending on the sputtering time, i.e., depth.