Supporting information for

H$_2$S$_{(g)}$ removal using a modified, low-pH liquid redox sulfur recovery (LRSR) process with electrochemical regeneration of the Fe catalyst couple

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Figure S1. Schematic of the proposed process

Figure S2. Schematic of the laboratory system used in the Fe(II) electrochemical oxidation study.

Figure S3. H$_2$S$_{(g)}$ removal efficiency in a bubble column reactor as a function of the H$_2$S$_{(g)}$

concentration, normalized gas flux and Fe(III) concentration

Table S1. Experimental conditions applied in H$_2$S$_{(g)}$ reactive absorption experiments
Figure S1. Schematic of the proposed process

2Fe$^{3+}$ + 2e$^-$ → 2Fe$^{2+}$

H$_2$S → 2H$^+$ + S$_0$ + 2e$^-$

Electrolytic cell (Fe$^{3+}$ regeneration)

Hydrogen (H$_2$)

Elemental sulfur (S$_0$)

Treated gas

H$_2$S$_{(g)}$ contaminated gas

H$_2$S$_{(g)}$ absorption

Electrolytic cell

Fe$^{3+}$

H$_2$

Fe$^{2+}$

H$^+$

S$^0$ separation

Elemental sulfur (S$_0$)

Hydrogen (H$_2$)

Treated gas

H$_2$S$_{(g)}$ contaminated gas

H$_2$S$_{(g)}$ absorption
Figure S2. Schematic of the laboratory system used in the Fe(II) electrochemical oxidation study. 1- Chlorine trap; 2- Electrolyte holding vessel; 3- Flow-through electrolysis cell; 4- Peristaltic pump; 5- DC power supply
Figure S3. $\text{H}_2\text{S}_\text{(g)}$ removal efficiency in a bubble column reactor as a function of the $\text{H}_2\text{S}_\text{(g)}$ concentration, normalized gas flux and Fe(III) concentration (for detailed experimental conditions see Tests I and II in Table S1)
Table S1. Experimental conditions applied in $\text{H}_2\text{S}_\text{(g)}$ reactive absorption experiments

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<th>[Fe$^{3+}$]</th>
<th>[Fe$^{2+}$]</th>
<th>[Cl$^-$]</th>
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<th>[H$<em>2$S$</em>\text{(g)}$]</th>
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