Dataset for ‘Efficient Hematite Photoanodes Prepared by Spin Coating HCl-treated Sol Solutions of α-Fe2O3-FeOOH Nanoparticles and PVC-*g*-POEM Amphiphilic Graft Copolymer’

Data was collected using the PhotoElectroChemical apparatus located in a research laboratory of Dr Salvador Eslava located in Dept of Chemical Engineering, UoB. Photocurrent Densities were calulated from generated potential under illumination (at 1 sun equivalent) measured with an Ivium potentiostat and using Ivium Technologies IviumSoft software Release 2.031.

SEM surface micrographs were analyzed for particle size and surface coverage with ImageJ software.

**Summary of results**

Table shows preparation conditions of sol solutions for spin coating deposition, final particle size and surface coverage in sintered hematite photoanodes, and photocurrent densities measured at 1.23 V vs. RHE under 1 sun AM1.5 illumination in aqueous KOH.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sample Name | Polymer Concentration [wt %](a) |  Acac-hematite [mg](b) | 37% HCl [mL] | Number of Depositions | Film Particle Size [nm] | Surface Coverage [%] | Photocurrent Density[mAcm-2](Forward/Backward) |
| 0.00mlHCl | 6.0 | 30 | 0 | 1 | 73 ± 25 | 46 | 0.80 ± 0.20 /087 ± 0.04 |
| 0.05mlHCl | 6.0 | 30 | 0.050 | 1 | 73 ± 15 | 58 | 0.93 ± 0.09 /1.03 ± 0.05 |
| 0.10mlHCl | 6.0 | 30 | 0.100 | 1 | 67 ± 19 | 65 | 1.17 ± 0.10 /1.12 ± 0.08 |
| 0.10mlHCl-2L | 6.0 | 30 | 0.100 | 2 | 75 ± 14 | 69 | 1.12 ± 0.11 /1.07 ± 0.08 |
| 0.10mlHCl-3L | 6.0 | 30 | 0.100 | 3 | 78 ± 13 | 72 | 0.68 ± 0.12 /1.02 ± 0.15 |
| 0.15mlHCl | 6.0 | 30 | 0.150 | 1 | 84 ± 16 | 61 | 0.56 ± 0.25 /0.67 ± 0.28 |

Addtional data included in the dataset are:

1. Unused TEM images
2. Unused SEM images
3. Raw IR data

Other data will be provided in the results and SI section of the published version of this paper.