Supplementary Materials

Table S1. *The fitted model parameters used to describe the behaviour of Fe, H_2S and SO_4^{2-}*

Parameter	Description	Value	Units	Percent Error
$[IRM]_0$	Concentration of dissimilatory iron reducing microorgansims	6.95E-05 ± 0.00012	g/L	175%
$[Don]_0$	Concentration of electron donor	2.33 ± 0.14	mM	5.92%
$[Fe^{2+}]_0$	Concentration of ferrous iron	0	mM	NA/Fixed
$[Fe^{3+}]_0$	Concentration of ferric iron	0.1	mM	NA/Fixed
$[FeS]_0$	Concentration of iron sulphide	0	mM	NA/Fixed
$[H_2S]_0$	Concentration of hydrogen sulphide	0	mM	NA/Fixed
Percent loss of H_2S	Percent of H_2S lost prior to measurement	0.95 ± 0.02	mM	2.15%
$[SO_4^{2-}]_0$	Concentration of sulphate	3.897	mM	NA/Fixed
SRM	Concentration of sulphate-reducing microorganisms	0.00024 ± 0.00056	g/L	229.3%
Y_{IR}	Microbial yield coefficient for dissimilatory iron reducing microorgansims	0.012	g cells / mmol Don	NA/Fixed
Y_{SR}	Microbial yield coefficient for sulphate-reducing microorgansims	0.0048	g cells / mmol Don	NA/Fixed

k_{IR}	Rate constant for dissimilatory iron reducing microorgansims	59.8 ± 91.0	$L^2/g \cdot mmol\ Fe^{3+} \cdot d$	152 %
k_{SR}	Rate constant for sulphate-reducing microorganisms	74.0 ± 36.7	$L/g \cdot d$	49.6%
k_d	Microbial death rate	0.01	d^{-1}	NA/Fixed
k_{precip}	Rate constant for iron sulphide precipitation	0.062 ± 0.0094	mM FeS/d	15.1%