

**Table S2.** Sulfur parameters for phase 2 samples. R1, R2: petro F76; R3, R4: FT-F76; R5, R6: 1:1 mix of petro- and FT-F76; R7, R8: no added fuel. A. Sulfate Reduction Activity. The average of triplicate samples is shown in units of  $\mu\text{mol S/mL/day}$ . Samples with SRA significantly above baseline values are shown in bold. SRA value of the original seawater used for filling the reactors (Day 0) was  $0.032 \mu\text{mol S/mL/day}$  (average of 5 replicates). B. Concentration of  $\text{H}_2\text{S}$  in aqueous samples (ppm).

| <b>A. Sulfate Reduction Activity</b> |            |              |            |              |            |            |
|--------------------------------------|------------|--------------|------------|--------------|------------|------------|
| <b>Time (days)</b>                   | <b>402</b> | <b>431</b>   | <b>458</b> | <b>528</b>   | <b>591</b> | <b>764</b> |
| <b>R1: petro-F76</b>                 | 0.037      | 0.031        | 0.027      | 0.039        | 0.013      | 0.010      |
| <b>R2: petro-F76</b>                 | 0.040      | 0.036        | 0.032      | 0.029        | 0.018      | 0.017      |
| <b>R3: FT-F76</b>                    | 0.023      | 0.040        | 0.028      | 0.019        | 0.012      | 0.030      |
| <b>R4: FT-F76</b>                    | 0.021      | <b>0.400</b> | 0.035      | 0.022        | 0.011      | 0.022      |
| <b>R5: fuel mix</b>                  | 0.040      | 0.038        | 0.027      | 0.019        | 0.013      | 0.025      |
| <b>R6: fuel mix</b>                  | 0.046      | 0.045        | 0.035      | <b>0.260</b> | 0.015      | 0.036      |
| <b>R7: no fuel</b>                   | 0.027      | 0.024        | 0.029      | 0.019        | 0.083      | 0.024      |
| <b>R8: no fuel</b>                   | 0.027      | 0.033        | 0.023      | 0.021        | 0.015      | 0.025      |

| <b>B. <math>\text{H}_2\text{S}</math></b> |            |            |            |            |            |            |
|-------------------------------------------|------------|------------|------------|------------|------------|------------|
| <b>Time (days)</b>                        | <b>402</b> | <b>431</b> | <b>458</b> | <b>528</b> | <b>591</b> | <b>750</b> |
| <b>R1: petro-F76</b>                      | 0          | 0          | 0          | 0          | 0          | 0          |
| <b>R2: petro-F76</b>                      | 0          | 0          | 0          | 0          | <b>2.5</b> | 0          |
| <b>R3: FT-F76</b>                         | 0          | <b>5</b>   | <b>5</b>   | <b>2.5</b> | <b>7.5</b> | <b>5</b>   |
| <b>R4: FT-F76</b>                         | 0          | <b>2.5</b> | <b>5</b>   | <b>5</b>   | <b>5</b>   | <b>5</b>   |
| <b>R5: fuel mix</b>                       | 0          | 0          | 0          | 0          | 0          | <b>2.5</b> |
| <b>R6: fuel mix</b>                       | 0          | <b>2.5</b> | <b>5</b>   | <b>2.5</b> | <b>5</b>   | <b>5</b>   |
| <b>R7: no fuel</b>                        | 0          | <b>5</b>   | 0          | 0          | <b>7.5</b> | <b>5</b>   |
| <b>R8: no fuel</b>                        | 0          | 0          | 0          | 0          | <b>2.5</b> | <b>5</b>   |