Lena filtered water sample.

Method – Three different functionalised grids where used. Positively charged (attracts negatively charged particles), negatively charged (attracted positively charge particles) and PEG coated (good for organics). Fe-rich particles where found on both –ve and +ve grids, but –ve grids collected more Fe-rich particles of interest. PEG coated grids where not that effective for Fe-rich particles. The grids where held in tweezers and stirred in the 0.22um filtered water sample for ~3 mins, then washed in IPA and air dried prior to investigation in the TEM. Images and EDX spectra where collected. SAED of particles was attempted but no usable patterns collected due to interferences with the grid coating material. Sample 51, 55 and 66 were investigated. C and Cu in EDX spectra are due to the grids. Grids also contain small amounts of Si.

Results.

Original data files are available at

<http://homepages.see.leeds.ac.uk/~earitb/LenaTEM/>

Interpretation - Based on morphology and composition data below it is very likely that the Fe fraction (present in Lena River water samples) that passes 0.22um filters but retained on 10kDa filters is 20-30 nm aggregates of 2-5 nm ferrihydrate particles. These were the only Fe-containing discovered.

Results – Sample 51 +ve grid; particle 0002

|  |  |
| --- | --- |
| N:\Ian Burke\Lena sample 51 +ve grid 0002.tif | N:\Ian Burke\Lena sample 51 +ve grid 0004.tif |

N:\Ian Burke\Lena sample 51 +ve grid 0002 EDX.tif

Typical of the FHY particles present.

Results – Sample 51 +ve grid; particle 0006

|  |  |
| --- | --- |
| N:\Ian Burke\Lena sample 51 +ve grid 0006.tif | N:\Ian Burke\Lena sample 51 +ve grid 0007.tif |

N:\Ian Burke\Lena sample 51 +ve grid 0006 EDX.tif

More FHY

Results – Sample 51 +ve grid; particle 0010

|  |  |
| --- | --- |
| N:\Ian Burke\Lena sample 51 +ve grid 0010.tif |  |

N:\Ian Burke\Lena sample 51 +ve grid 0010 EDX.tif

A rare Al-Si-O rich particle (mica or clay?)

Results – Sample 51 PEG grid; particle 0001

N:\Ian Burke\Lena sample 51 peg grid 0001 annotated.tif Ca-rich (Ca carbonate?)

N:\Ian Burke\Lena sample 51 peg grid 0001 EDX1.tif

N:\Ian Burke\Lena sample 51 peg grid 0001 EDX2.tif

Results – Sample 51 PEG grid; particle 0003

N:\Ian Burke\Lena sample 51 peg grid 0003.tifOrganic particle

N:\Ian Burke\Lena sample 51 peg grid 0003 EDX1.tif

Results – Sample 51 –ve grid; particle 0001

|  |  |
| --- | --- |
| N:\Ian Burke\Lena sample 51 -ve grid 0001.tif |  |

N:\Ian Burke\Lena sample 51 -ve grid 0001 EDX.tif

FHY? – Ca /Si rich too – some FHY had this composition.

Results – Sample 51 –ve grid; particle 0006

|  |  |
| --- | --- |
| N:\Ian Burke\Lena sample 51 -ve grid 0005.tif | N:\Ian Burke\Lena sample 51 -ve grid 0007.tif |

N:\Ian Burke\Lena sample 51 -ve grid 0007 EDX.tif

More FHY – very typical example.

Results – Sample 55 –ve grid; particle 0001

N:\Ian Burke\Lena sample 55 -ve grid 0001.tif

N:\Ian Burke\Lena sample 55 -ve grid 0001 EDX.tif

Results – Sample 55 –ve grid; particle 0004

N:\Ian Burke\Lena sample 55 -ve grid 0004.tif

N:\Ian Burke\Lena sample 55 -ve grid 0004 EDX.tif

Results – Sample 66 –ve grid; particle 0001

N:\Ian Burke\Lena sample 66 -ve grid 0001.tif

N:\Ian Burke\Lena sample 66 -ve grid 0001 EDX.tif