ostec corporate group

future's in the making

MicroXRF analysis of the ancient sword

XROS MF30 – laboratory x-ray microscope-microprobe for studies of the objects by the methods of the optical microscopy, radiography, local element XRF microanalysis with possibility of the element mapping. Using a microscope, a sample of up to 400 mm in size along the Y axis and of unlimited size along the X axis (max. scan area 150×150 mm; in the case of a larger area, the scanned areas can be stitched) and up to 105 mm high can be performed.
An overview video camera and two optical microscopes with magnification up to 200 times are using for accurate determination of the scanning area.
The central optical microscope with automated sharpness adjustment is combined with the axis of the microprobe (axis of the x-ray beam).
Local X-ray fluorescence microanalysis with the possibility of elemental mapping and X-ray studies can be carried out both separately and simultaneously.
Sample positioning accuracy is 10 microns.
The minimum diameter of the x-ray probe is 30 μm.
The range of simultaneously measured elements from ^{11}Na to ^{92}U.

Samples: fragments of ancient sword (X century).

Experiment #1

Figure 1 shows the photo of the sample. Figure 2 shows selected scan areas. Figures 3-9 show the elemental mapping of selected areas of the sample.

Figure 1. Photo of the sample

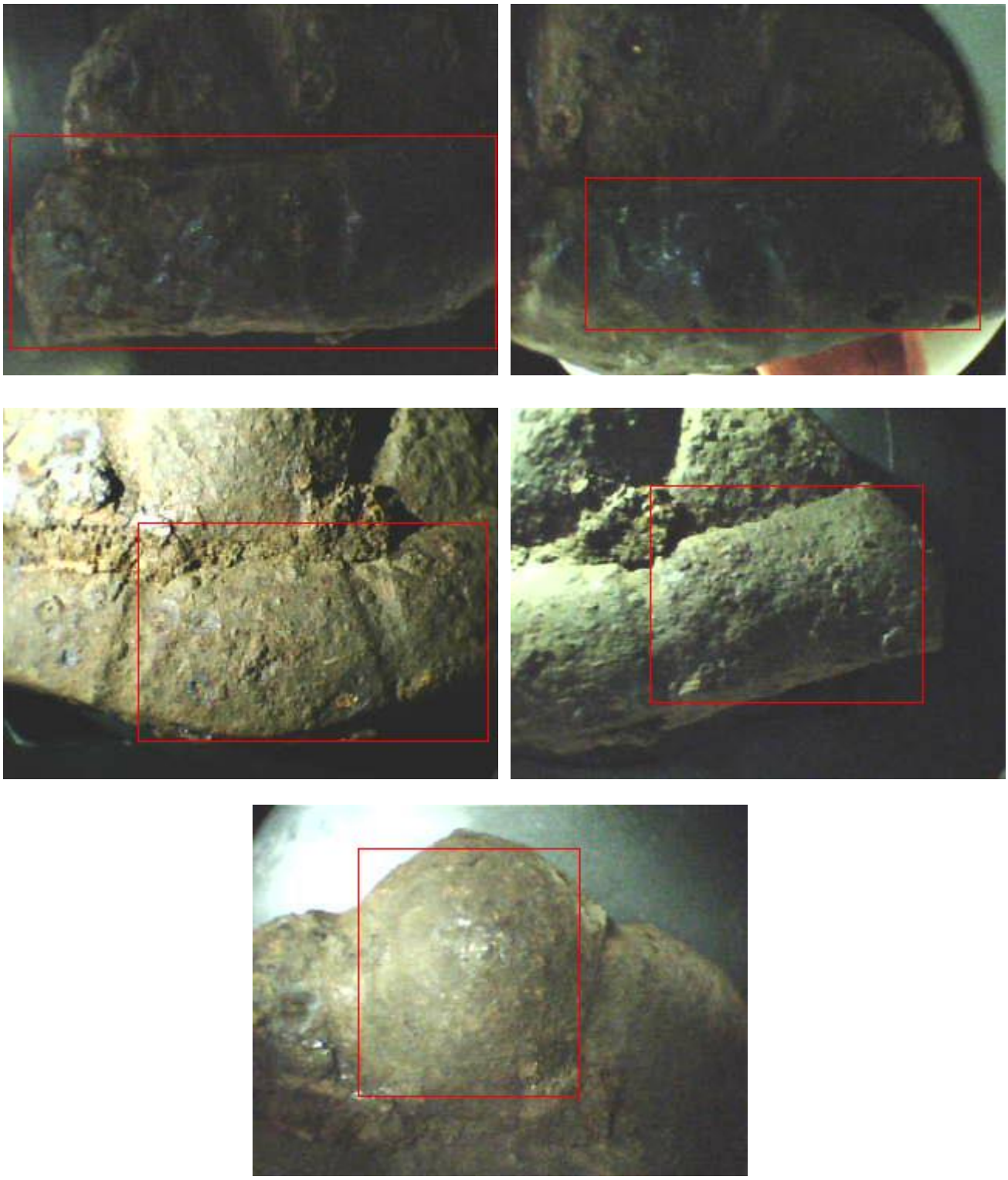


Figure 2. Scan areas are marked with red

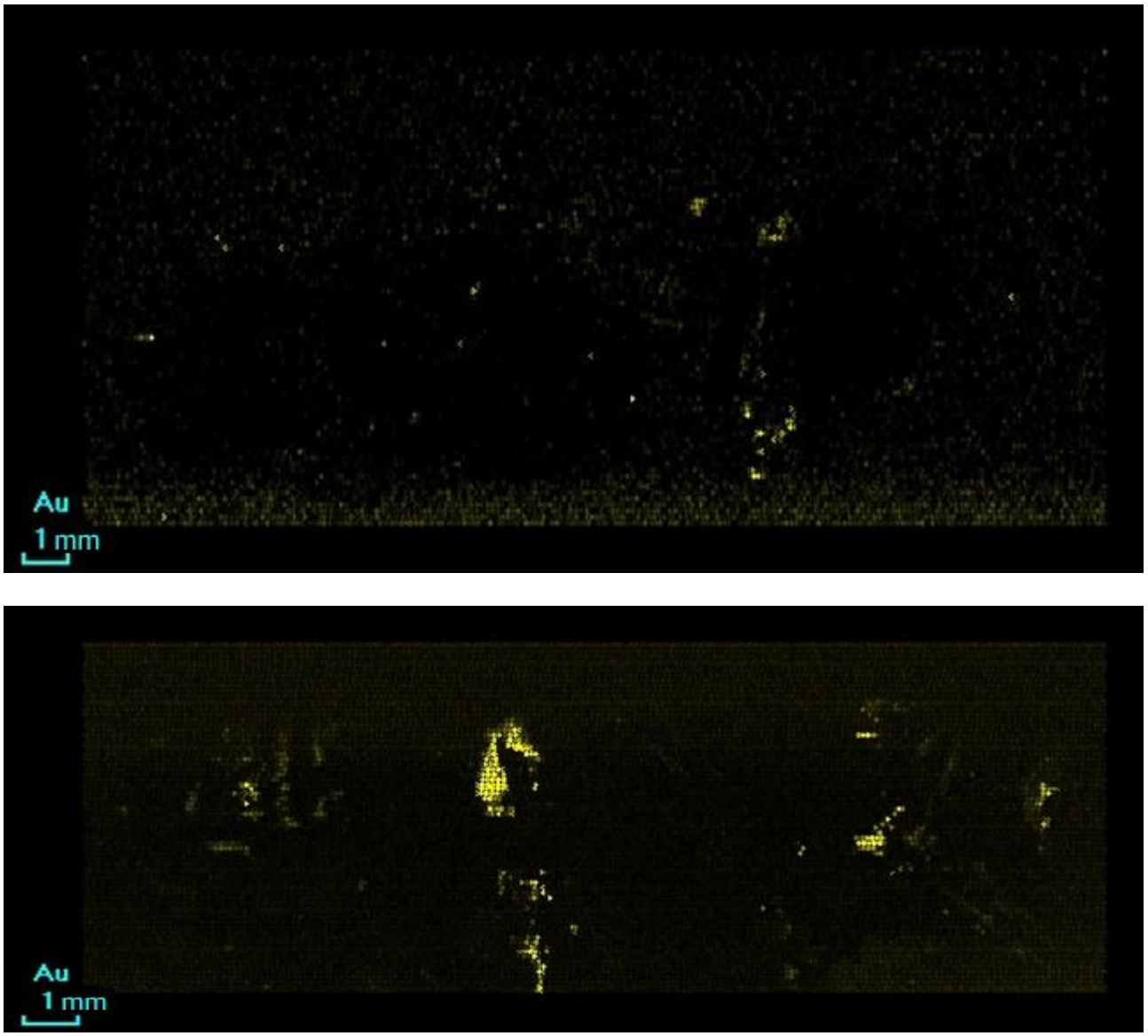
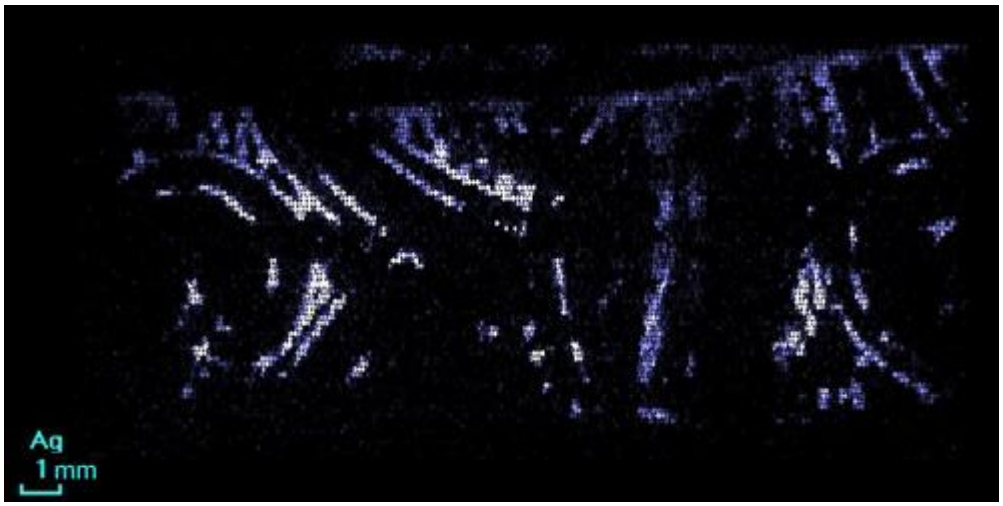
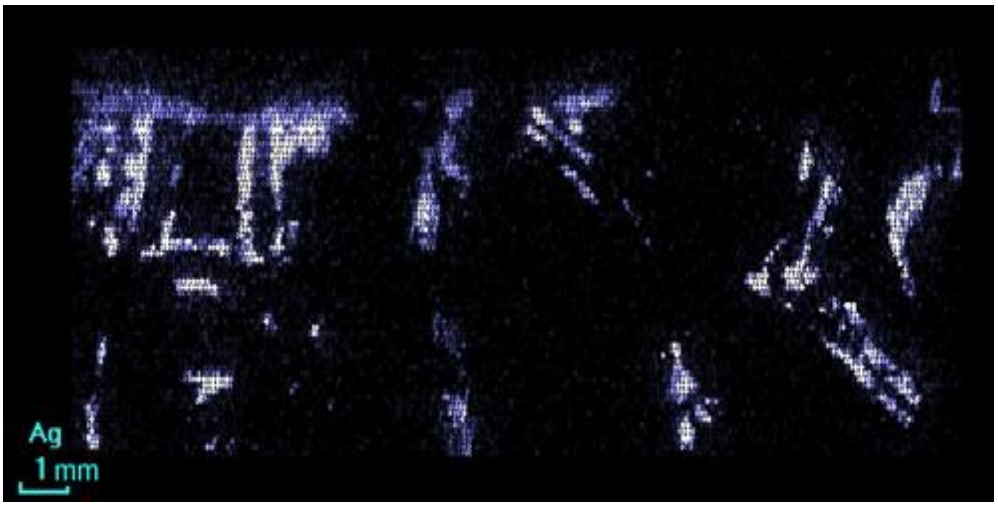
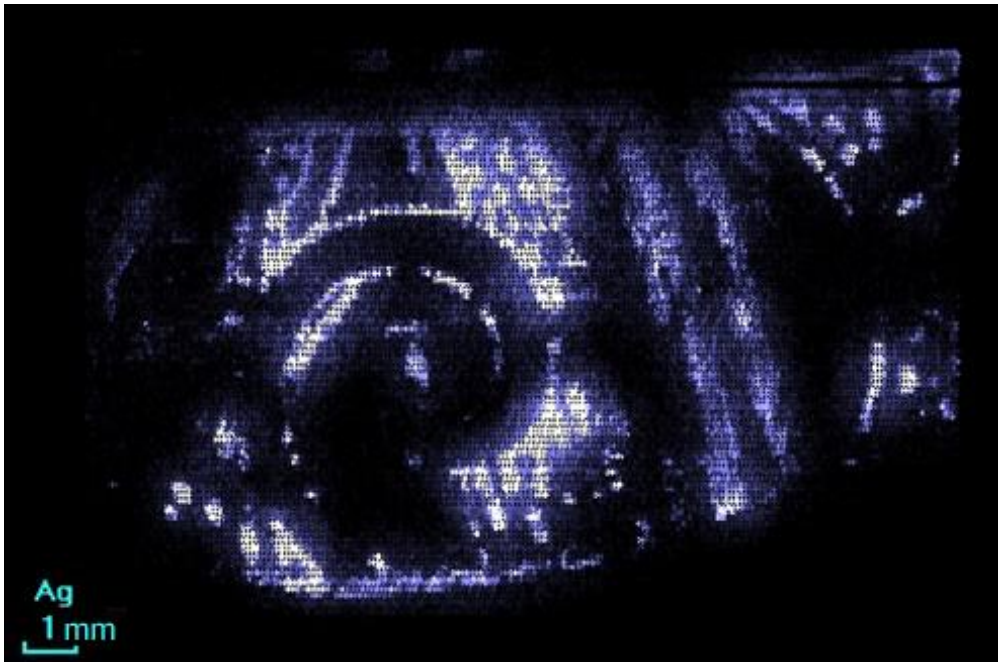


Figure 3. Au distribution


Ag
1 mm


Ag
1 mm


Ag
1 mm

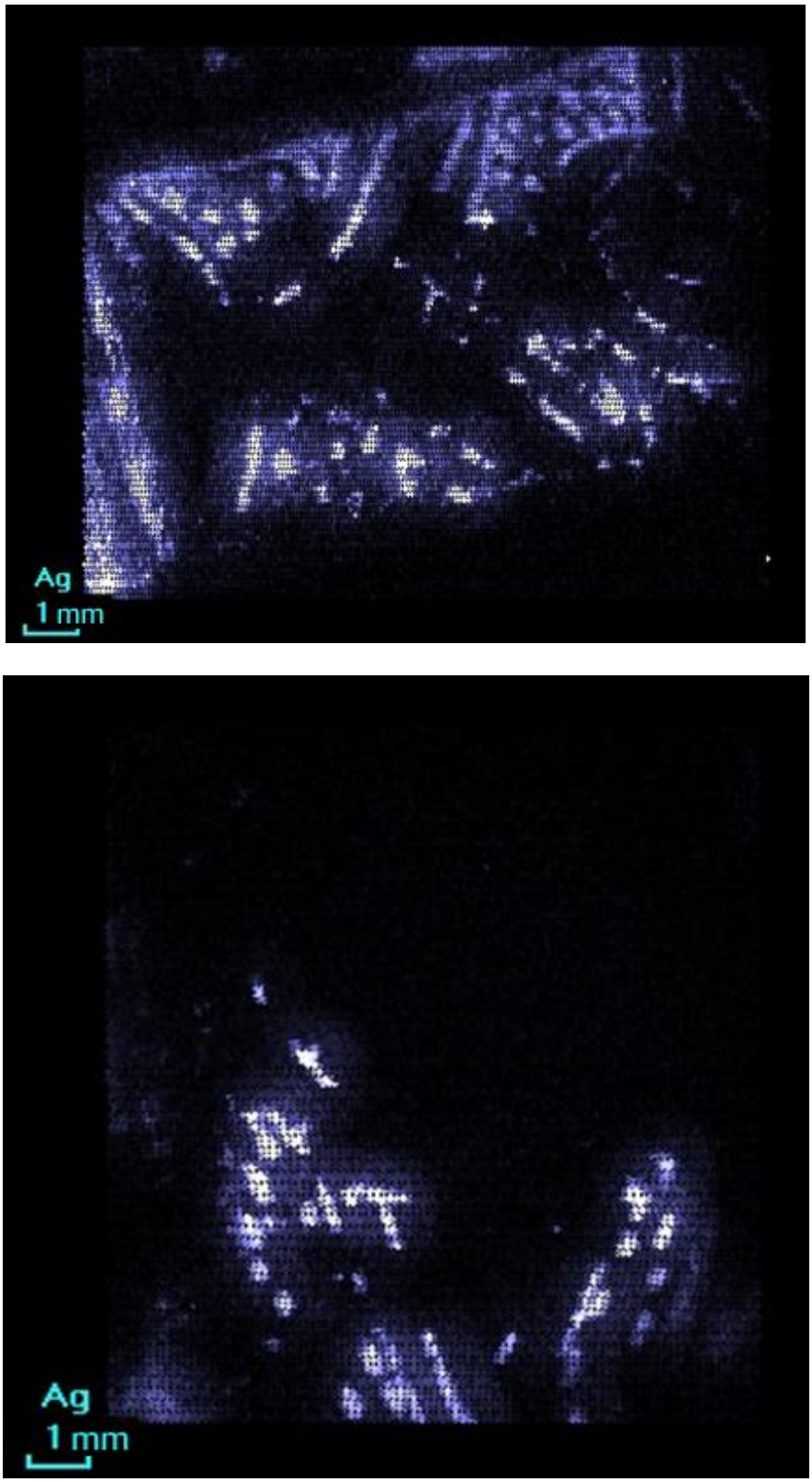


Figure 4. Ag distribution

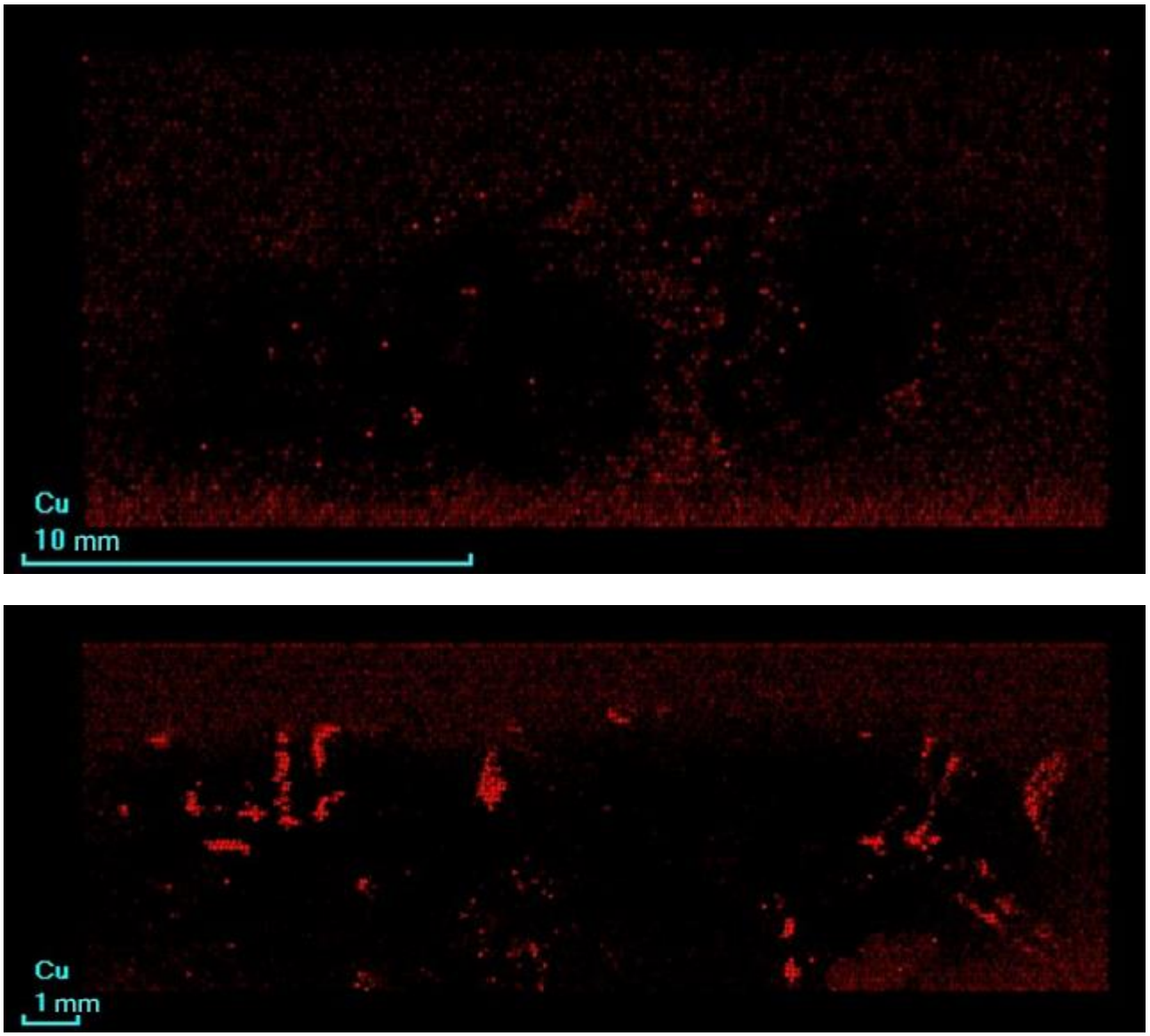


Figure 5. Cu distribution

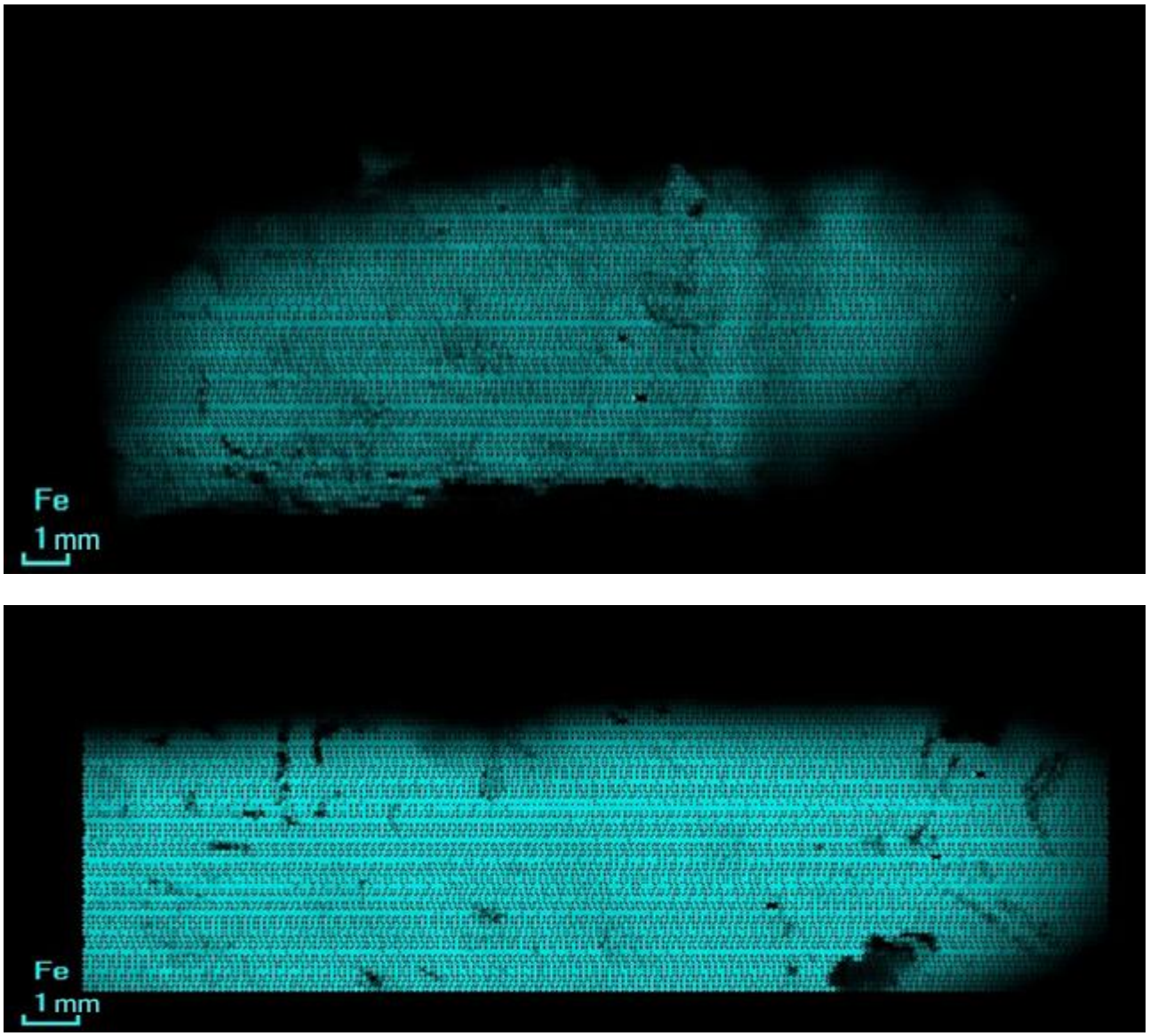


Figure 6. Fe distribution

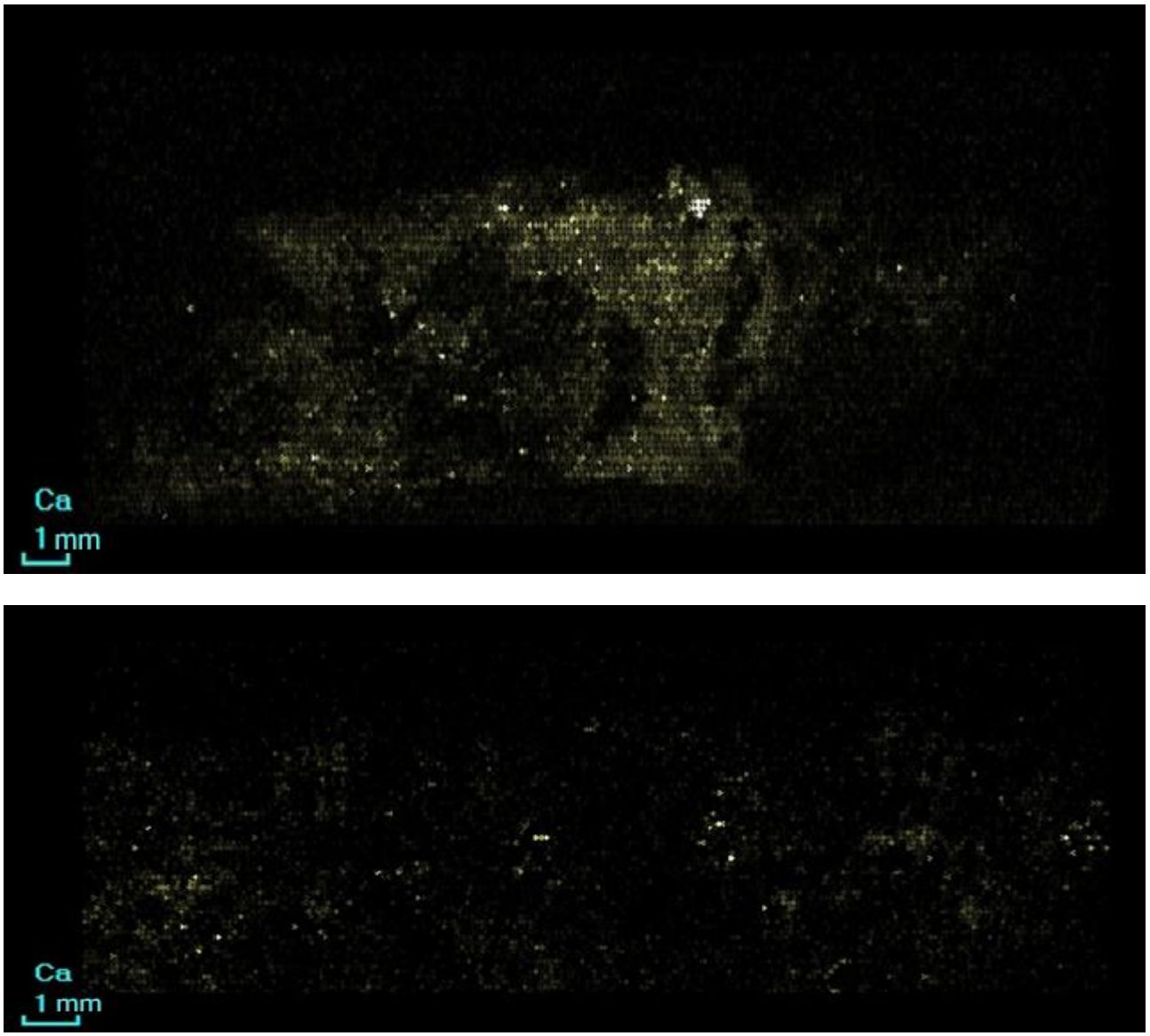


Figure 7. Ca distribution

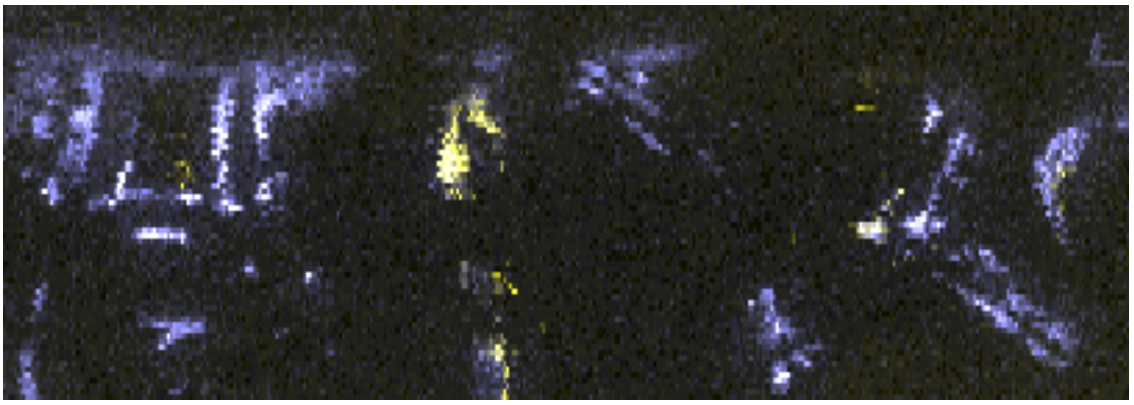


Figure 8. Au (yellow) and Ag (purple) distribution

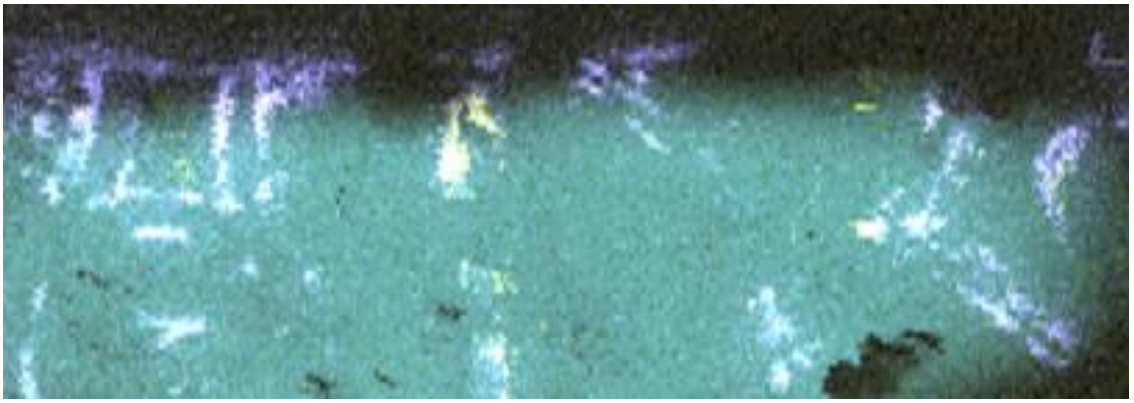


Figure 9. Au (yellow), Ag (purple) and Fe (green) distribution

Experiment #2

Figure 1 shows the photo of the sample. Figure 2 shows selected scan areas. Figures 3-12 show the elemental mapping of selected areas of the sample.

Figure 1. Photo of the sample

Figure 2. Scan areas are marked with red

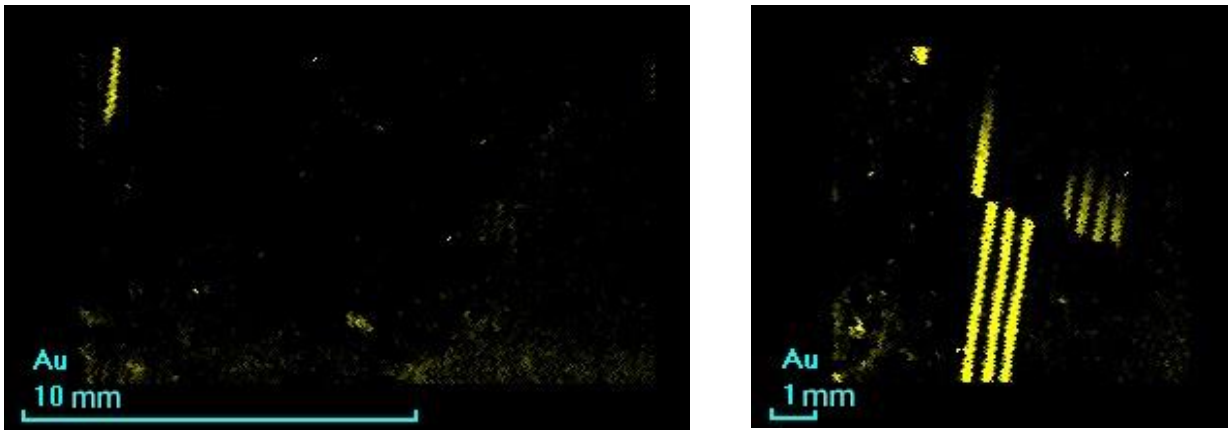


Figure 3. Au distribution

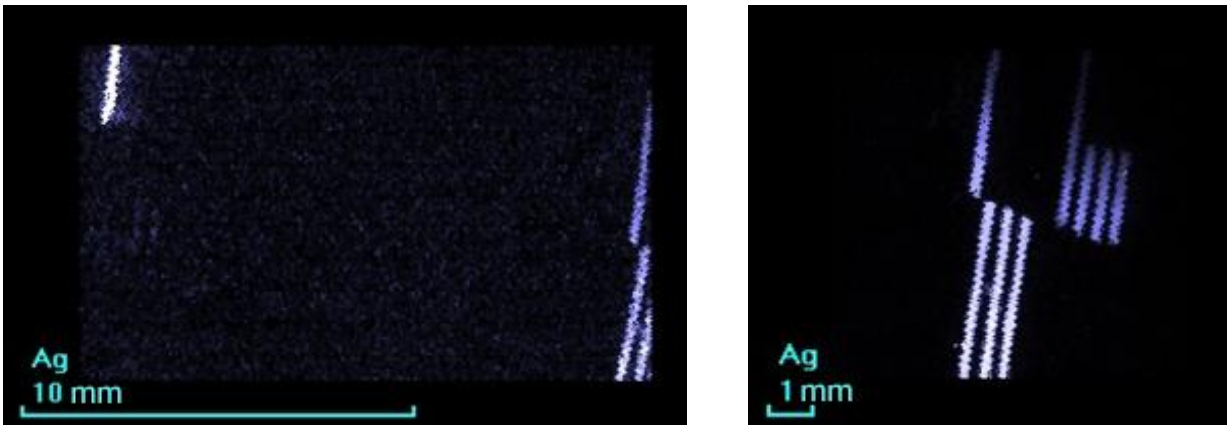


Figure 4. Ag distribution

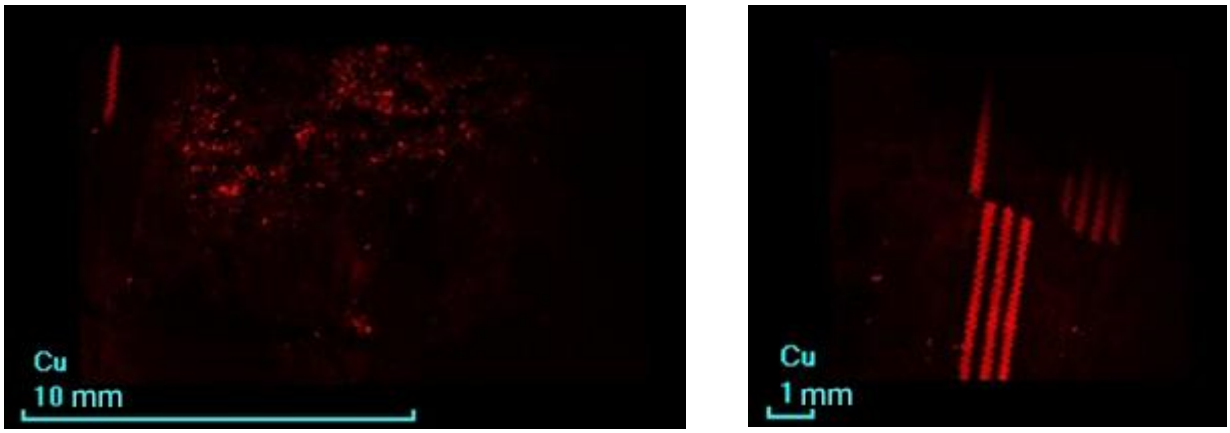


Figure 5. Cu distribution

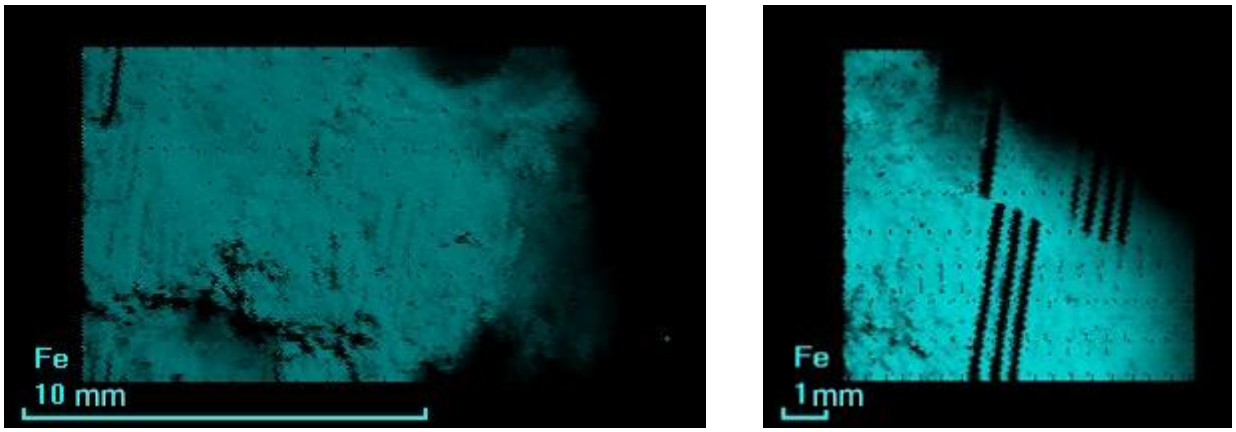


Figure 6. Fe distribution

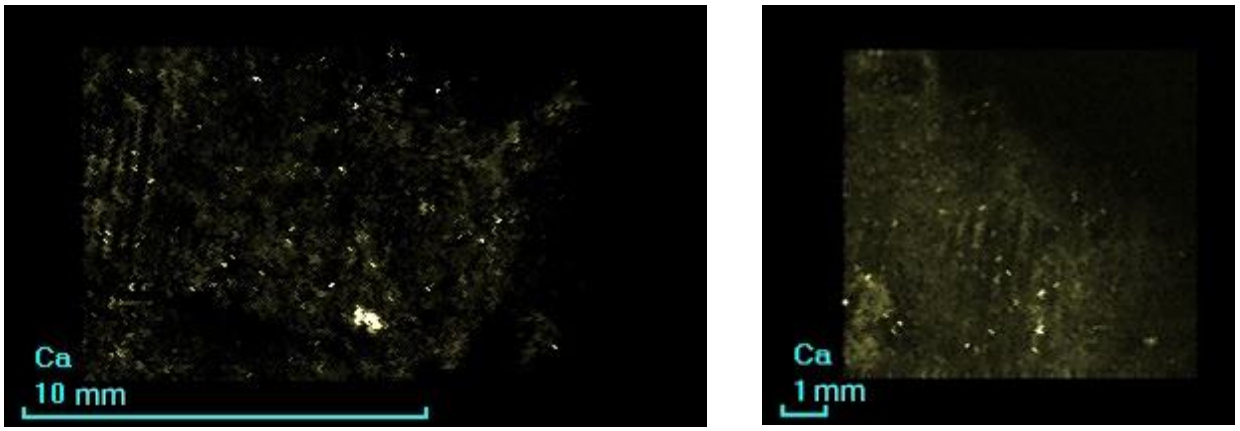


Figure 7. Ca distribution

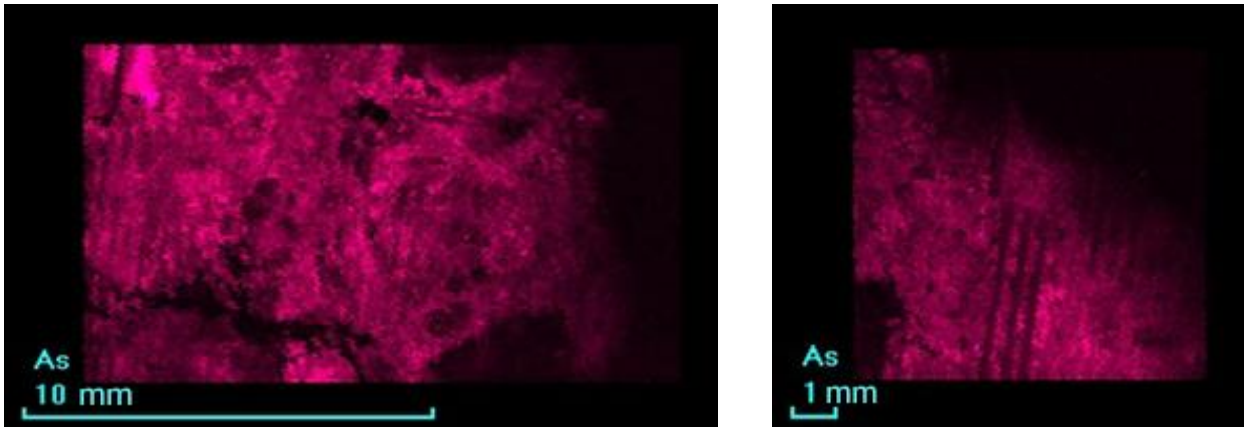


Figure 3. As distribution

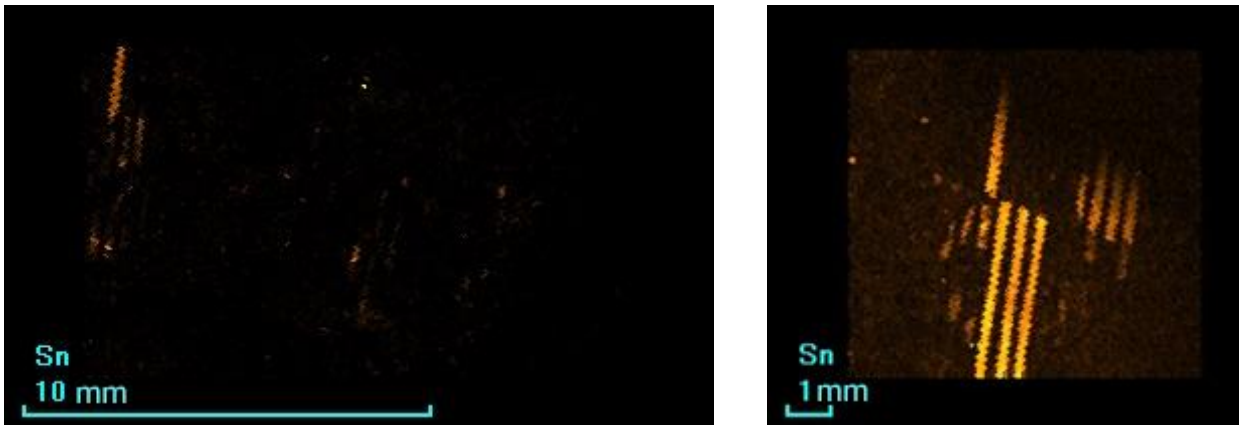


Figure 9. Sn distribution

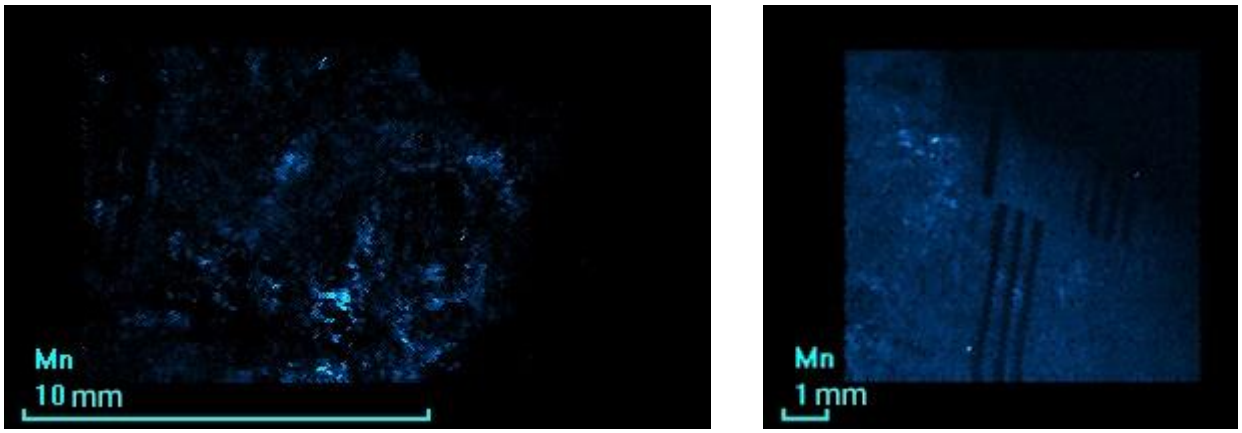


Figure 10. Mn distribution

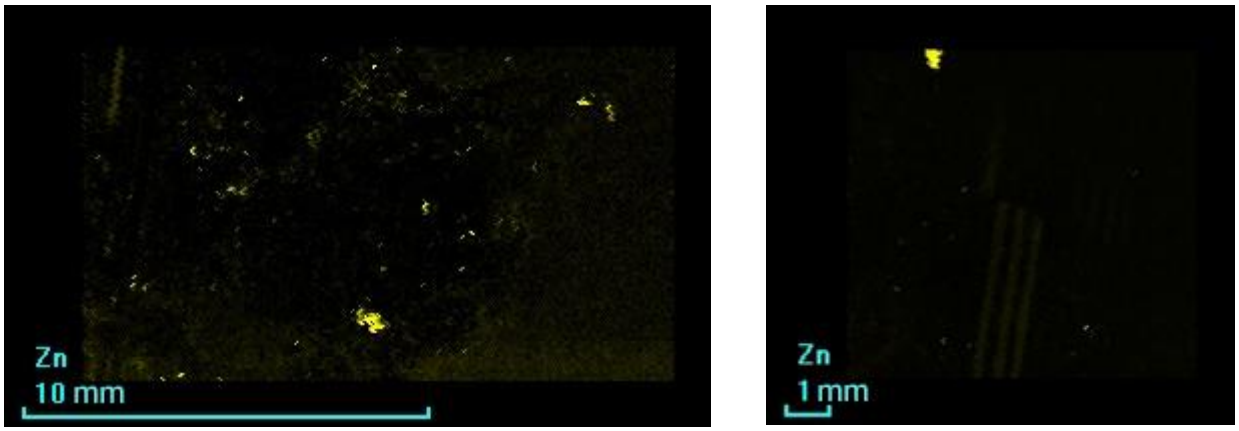


Figure 11. Zn distribution

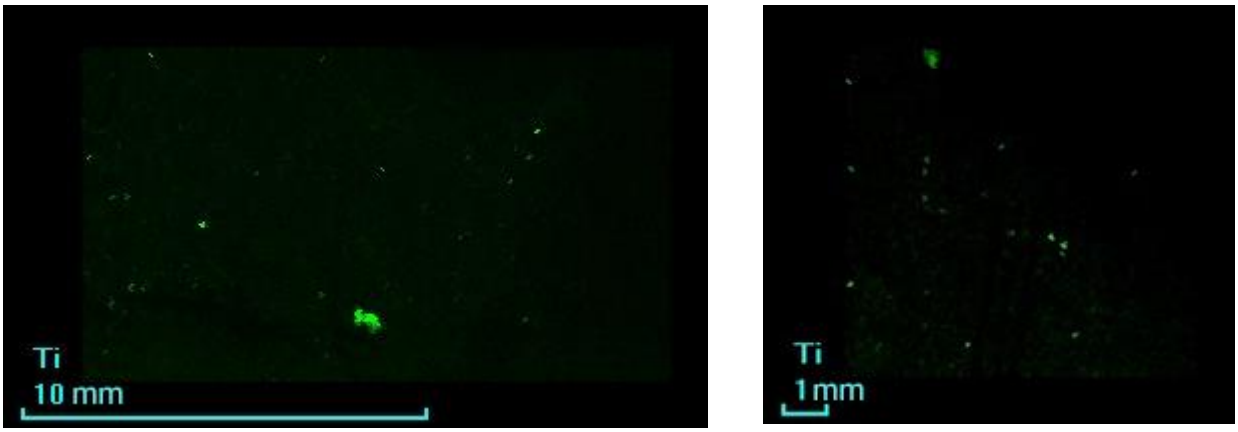


Figure 12. Ti distribution

Experiment #3

Figure 1 shows the photo of the sample. Figure 2 shows selected scan areas. Figures 3-11 show the elemental mapping of selected areas of the sample.

Figure 1. Photo of the sample

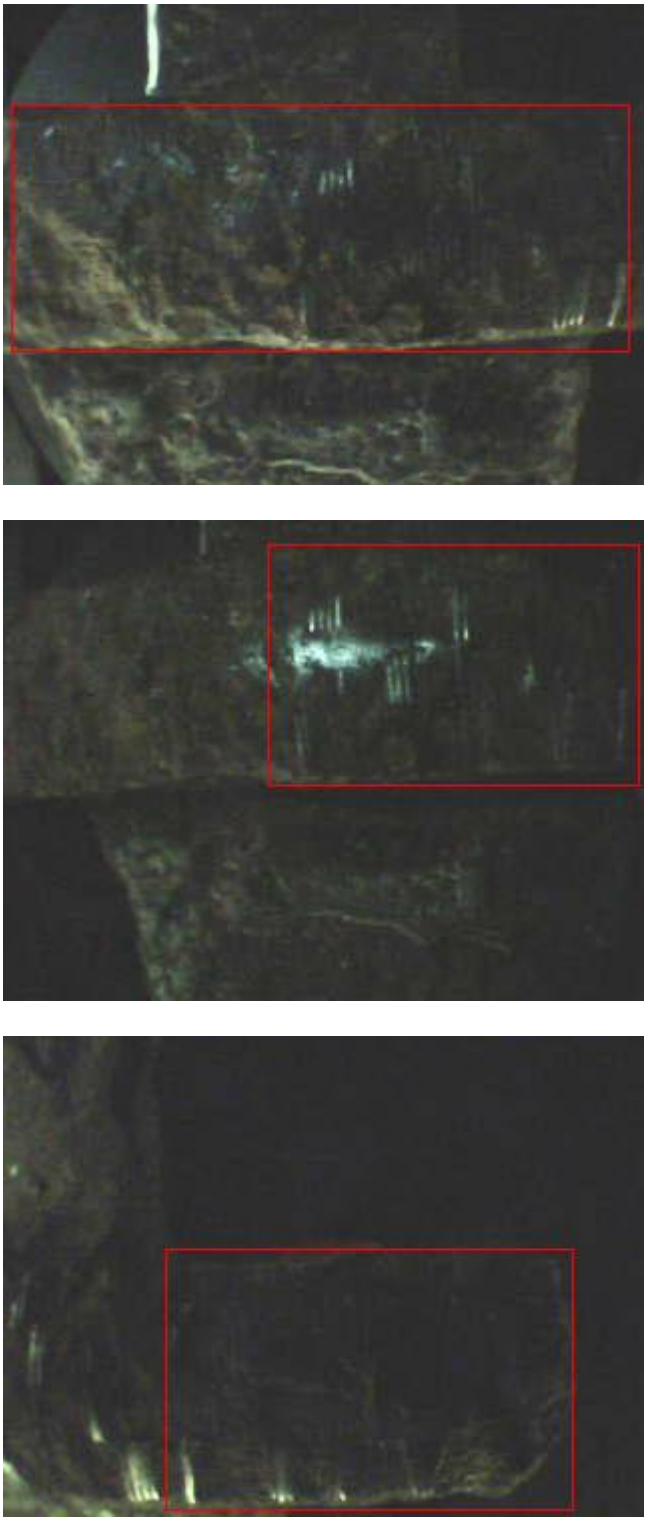


Figure 2. Scan areas are marked with red

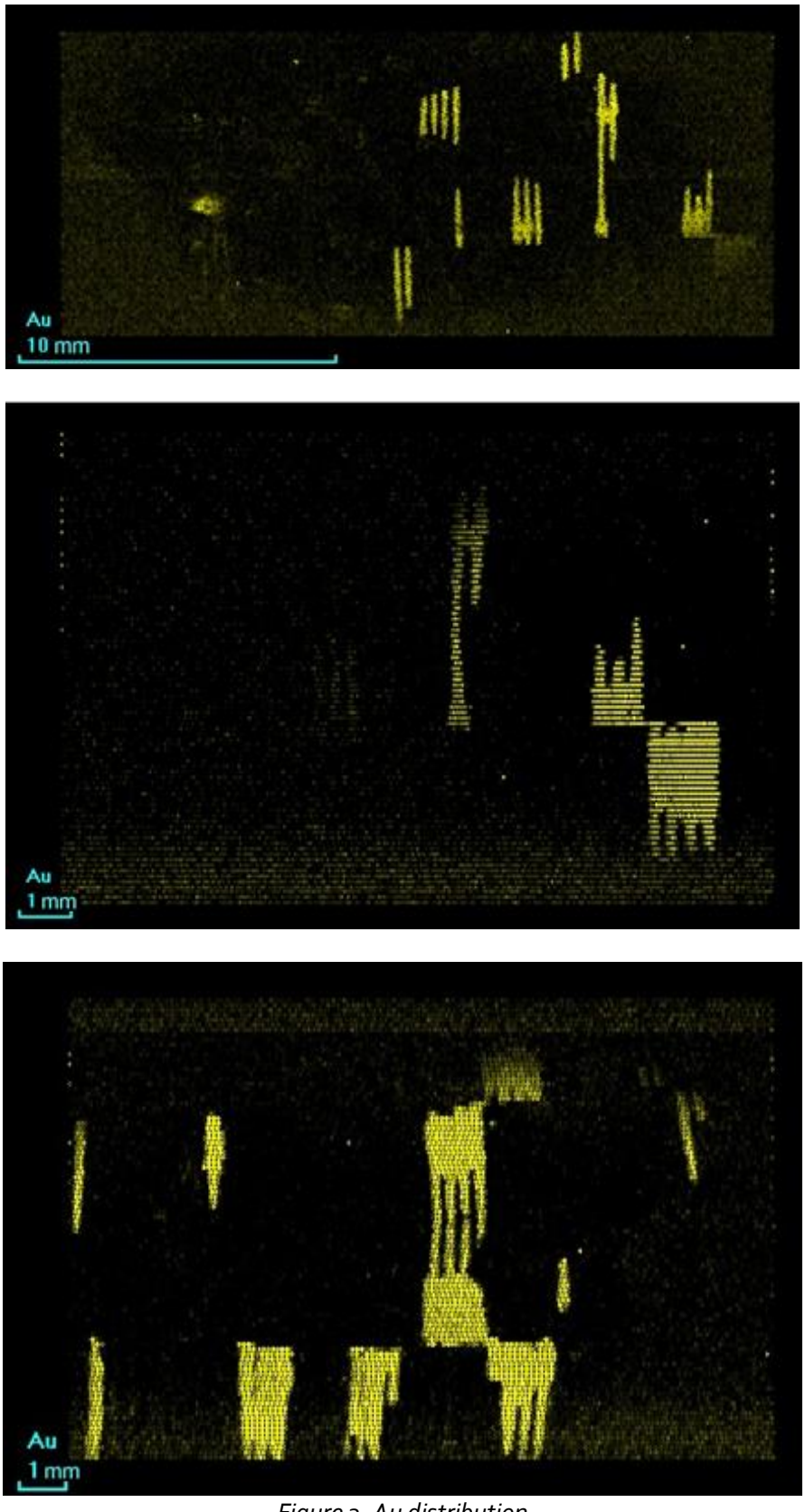


Figure 3. Au distribution

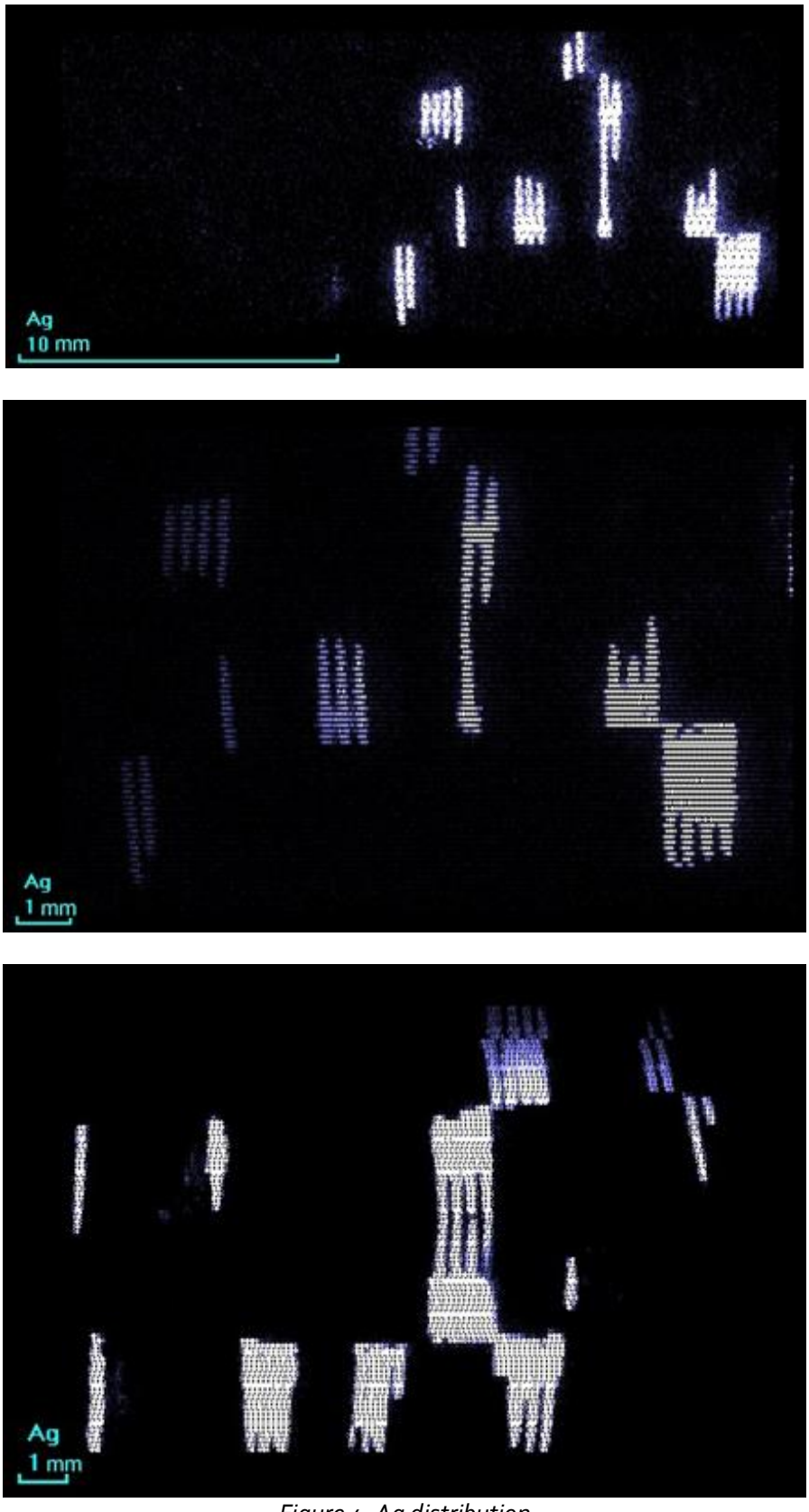
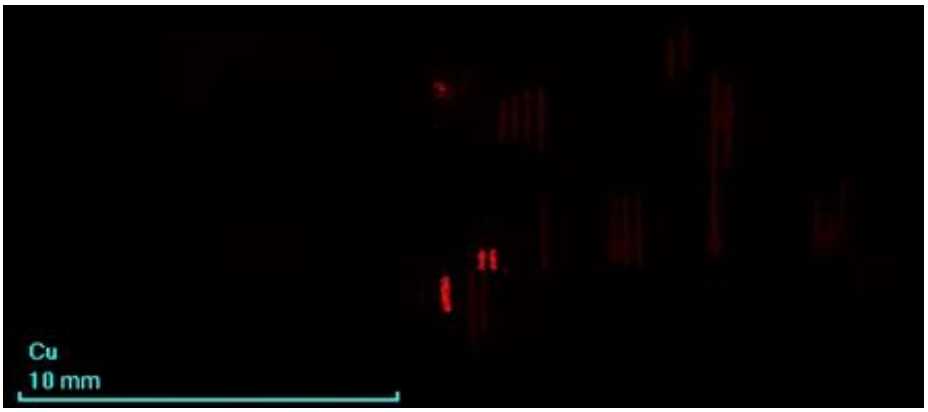
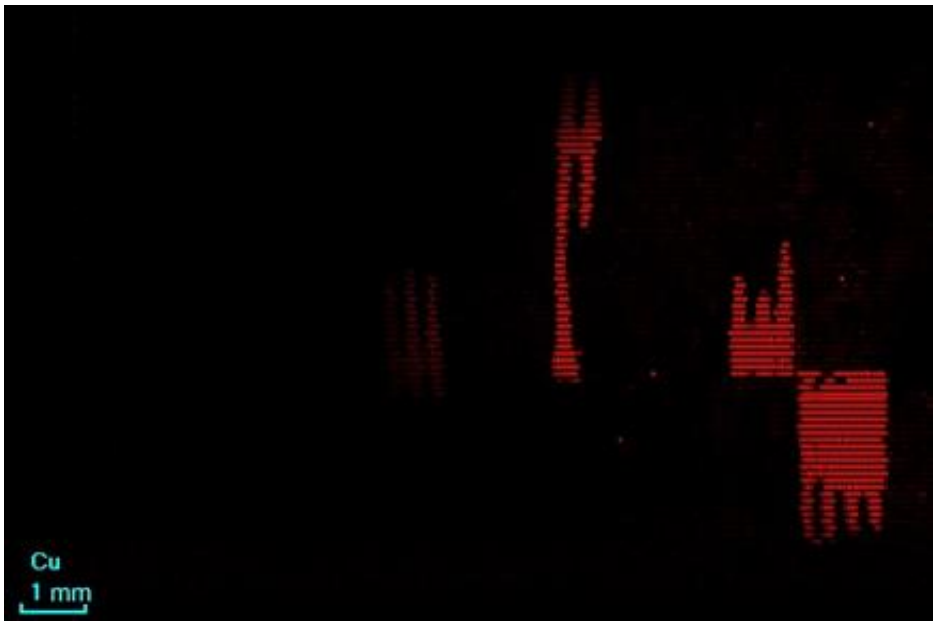


Figure 4. Ag distribution


Cu
10 mm


Cu
1 mm

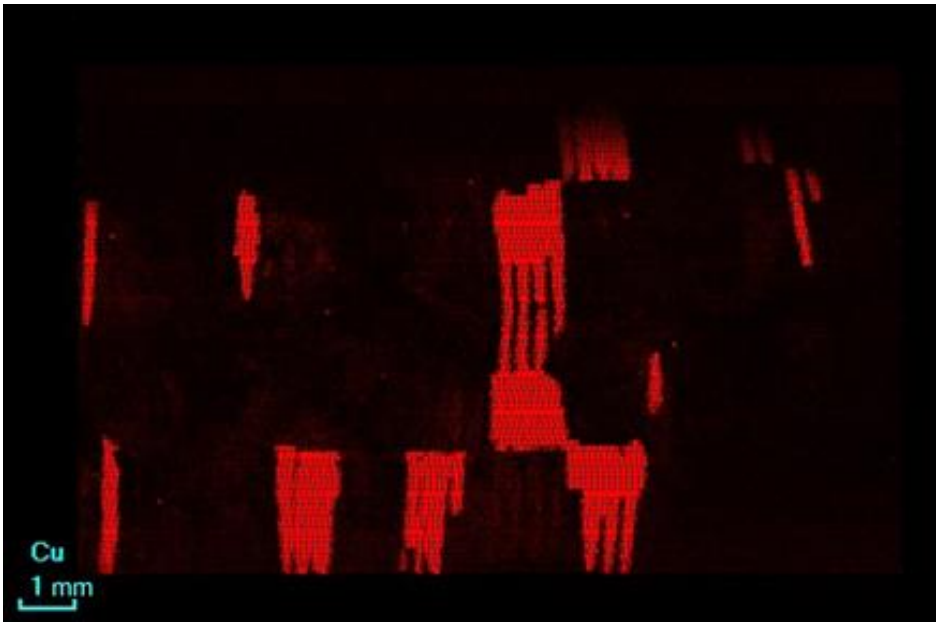

Cu
1 mm

Figure 5. Cu distribution

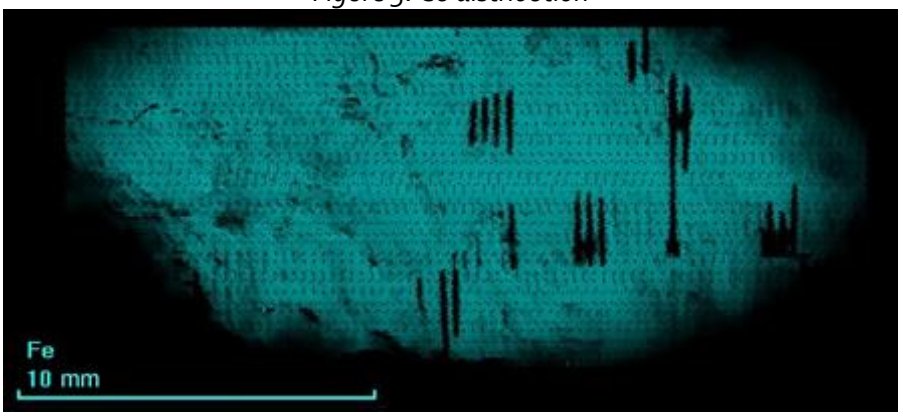
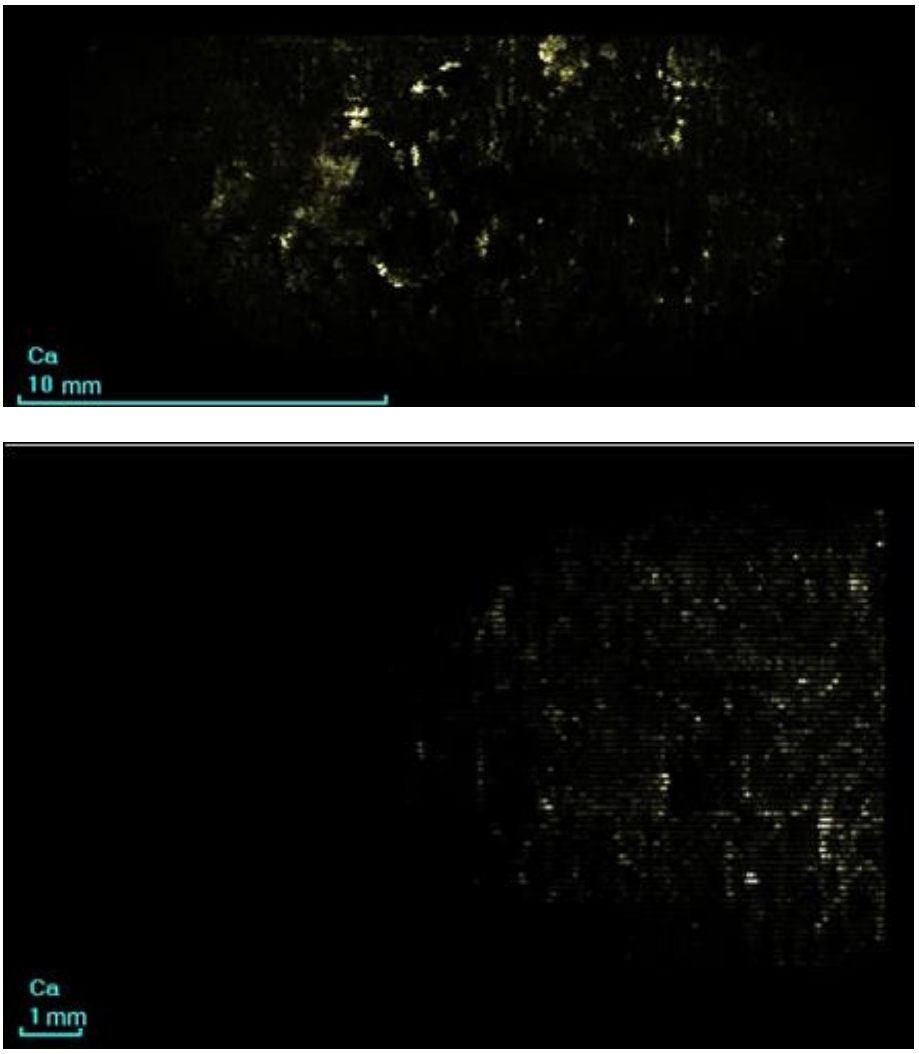


Figure 6. Fe distribution



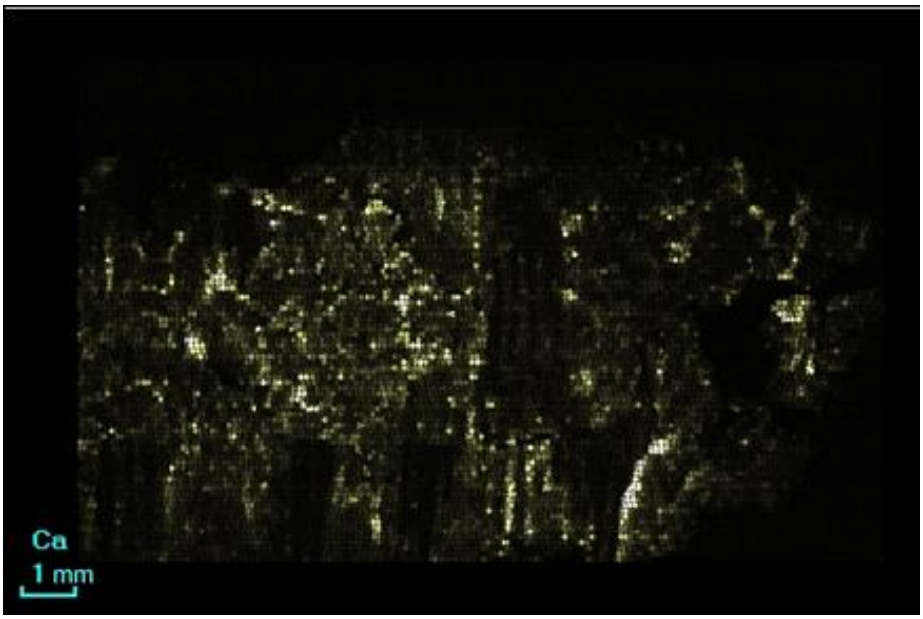
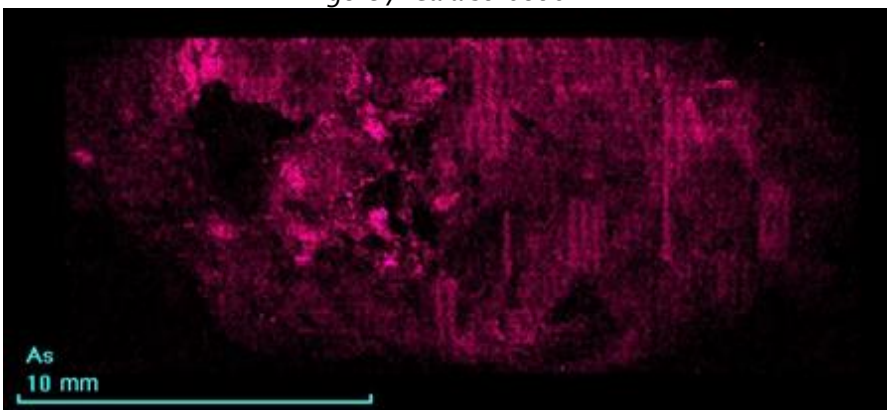
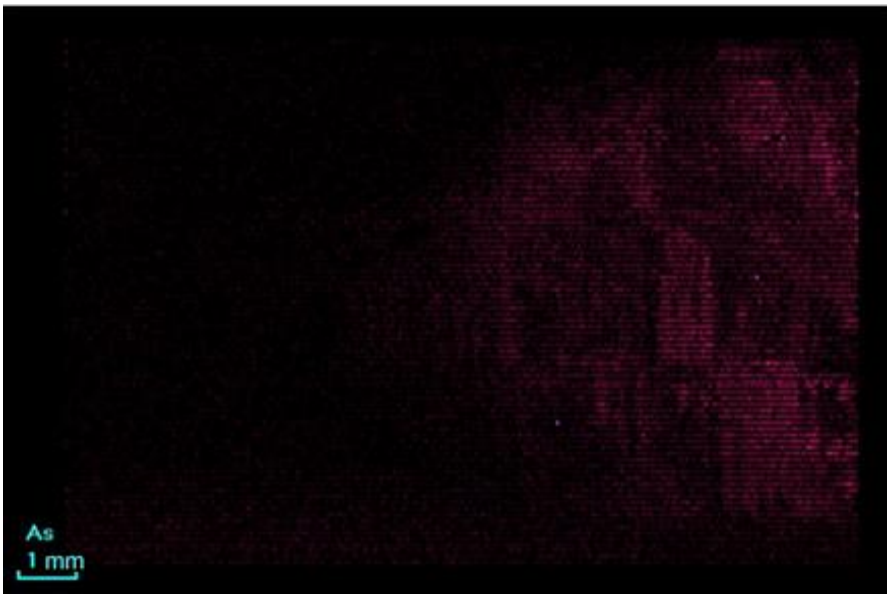


Figure 7. Ca distribution





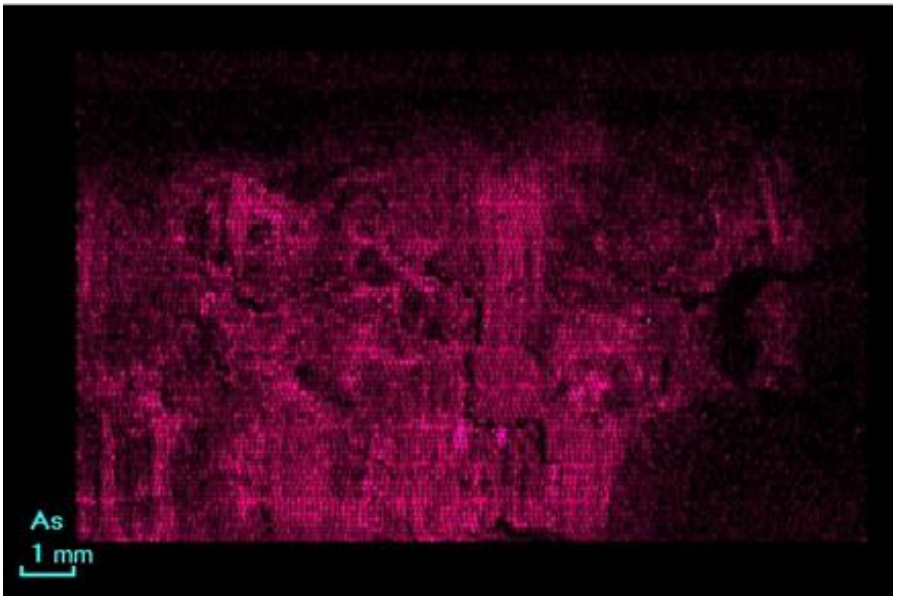
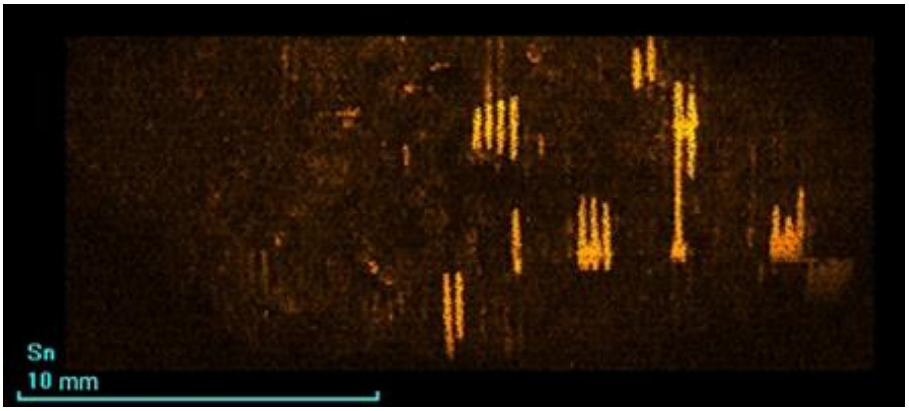
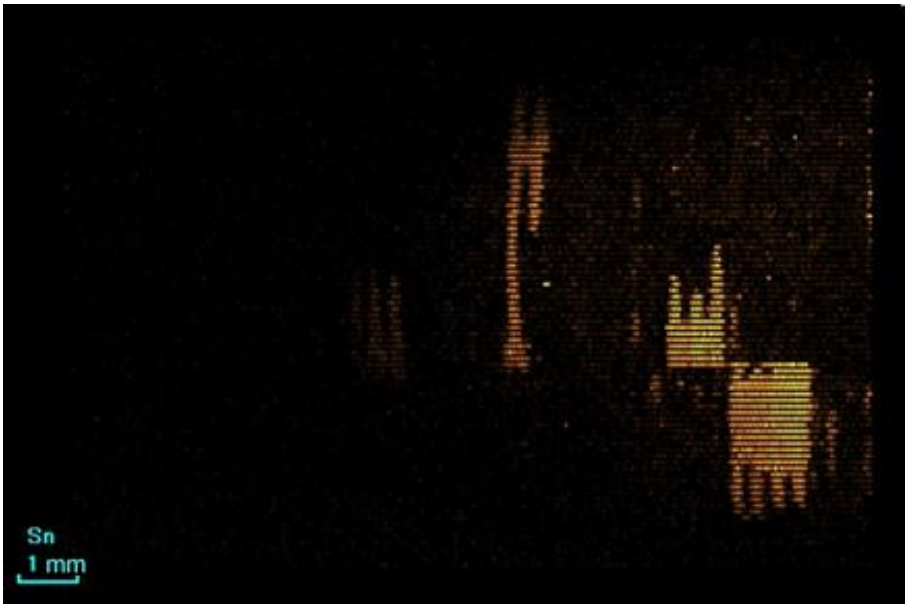


Figure 8. As distribution





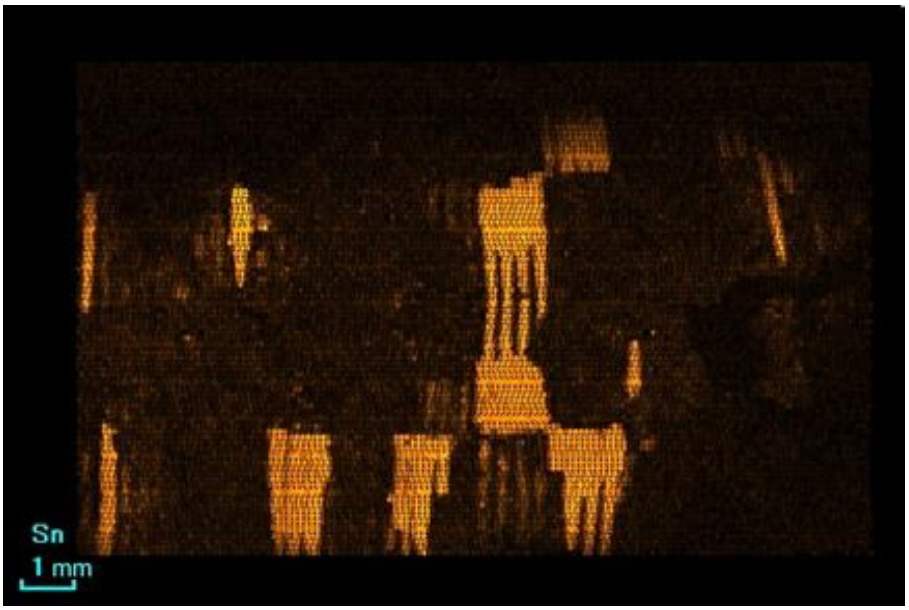


Figure 9. Sn distribution

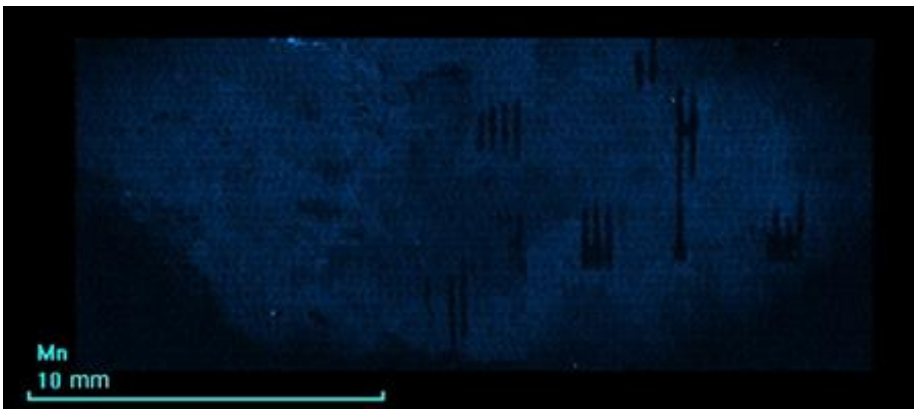


Figure 10. Mn distribution

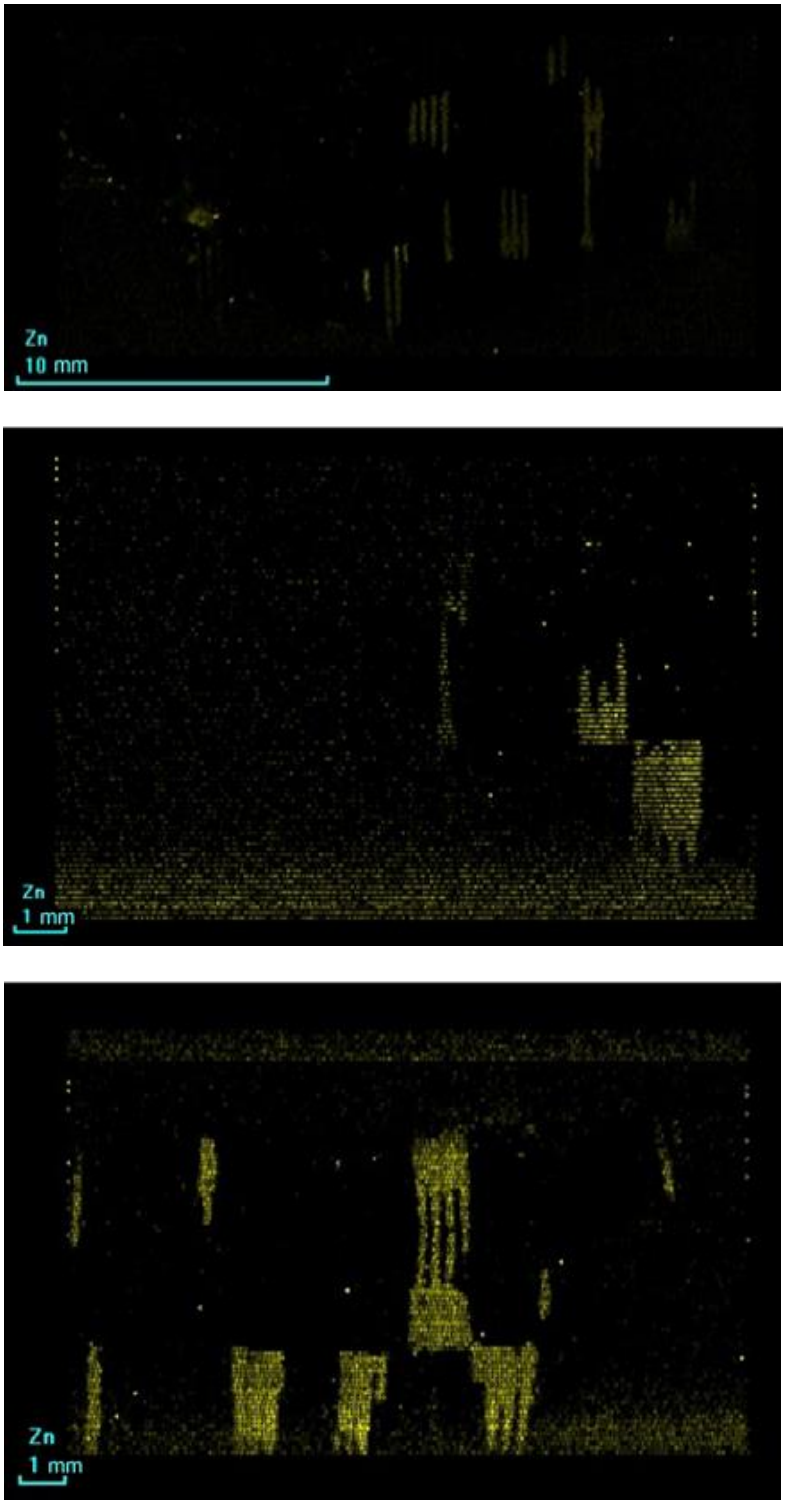


Figure 11. Zn distribution