

MicroXRF analysis of the solder



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 .

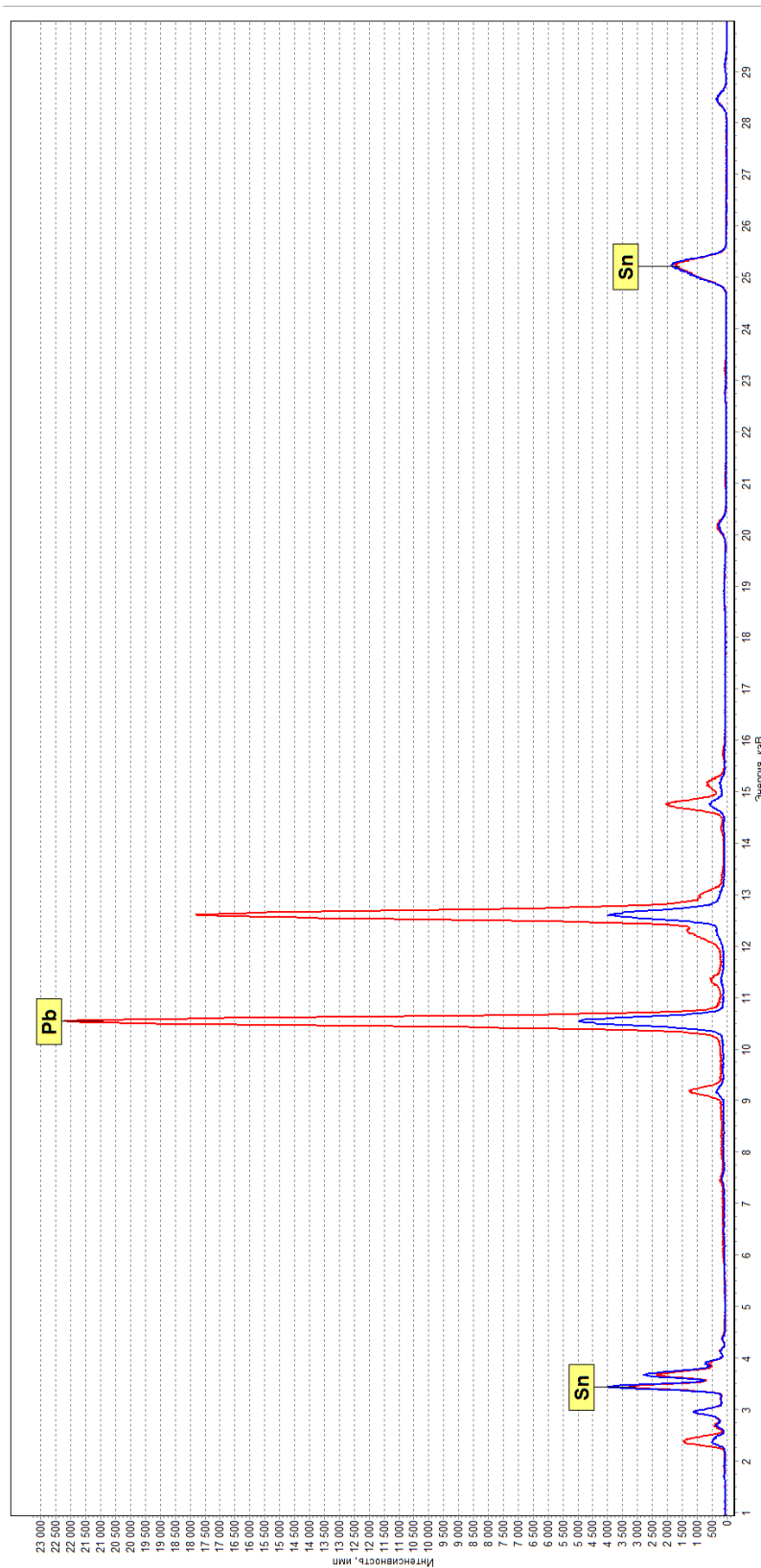


Fig. 1. Solder spectra: red - «POS-61» - 40% Pb, blue - «POS-90» - 10% Pb (U=4okV)

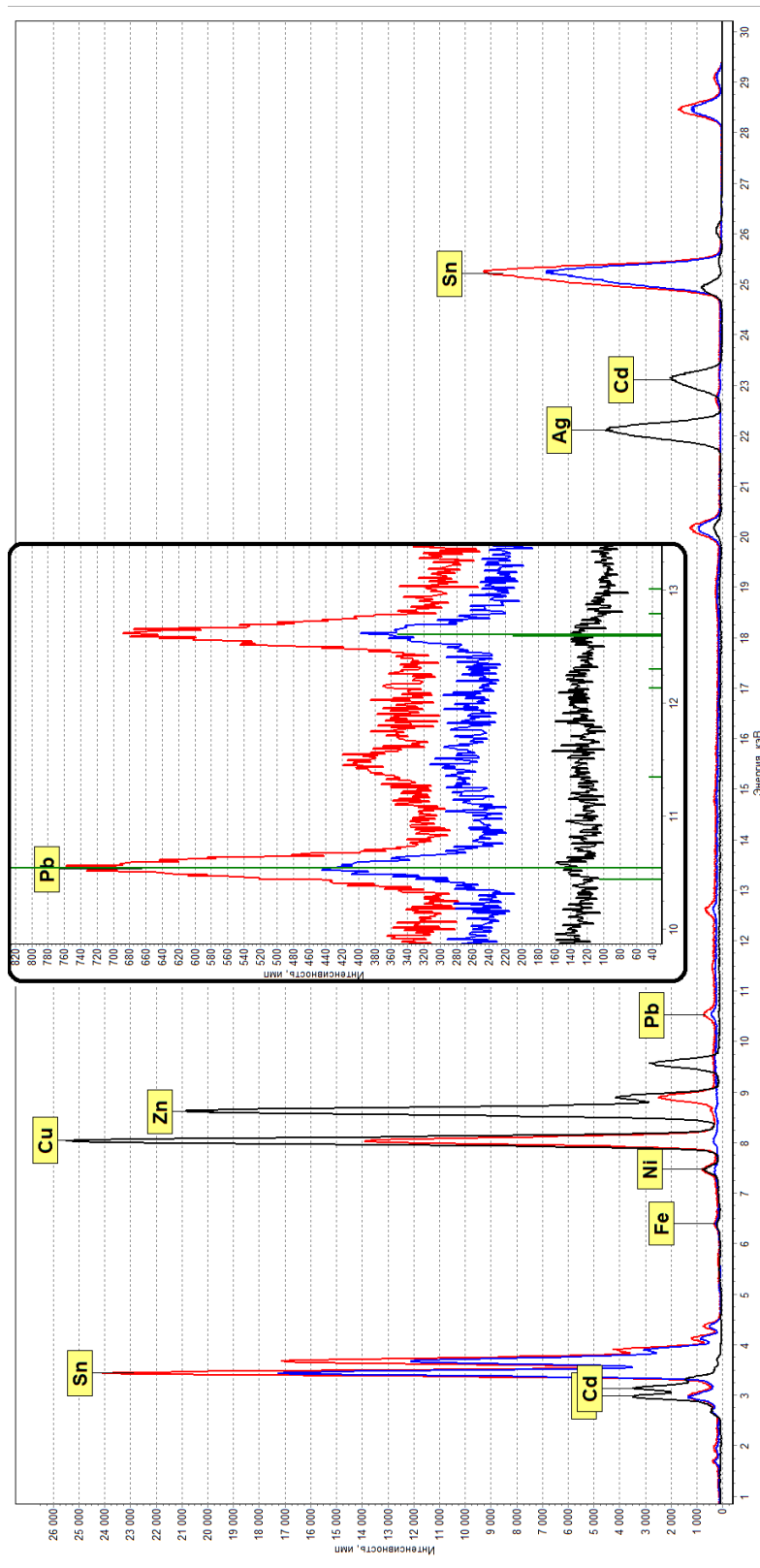


Fig. 2. Solder spectra: red - «S #1» - 0,26% Pb, blue - «S #2» - 0,15% Pb, black - «PSR-40» - 0,05% Pb (U=4okV)

Experimental details

Scanning interval	800 μm
Speed	800 $\mu\text{m/s}$
Measurement time	100 ms
Voltage	40 kV
Current	2 000 μA
X-ray tube	Mo anode
Atmosphere	air

Conclusion

The analysis demonstrated possibility to analyze solders to measure Pb, Sn, Ag, Sn, Cd composition. To make quantitative analysis it is necessary to make CRMs.