

Experiment Report Form



Experiment title: Nucleation and growth of MOFs (subexperiment: metal uptake by MOFs)	Experiment number: A31-1 173
Beamline: BM31	Date of report: 12.10.2022
Shifts:	<i>Received at ESRF:</i>
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Report:

The goal of the current experiments was to identify local structure around Ni²⁺ and Co²⁺ that were absorbed in various matrices at various PH, including the mixed-metal solutions.

Here we have measured it total about 50 pellets. We have found correlation between EXAFS signal and relative absorption amounts determined by UV spectroscopy. We have also found that the local environment of the metals was different from that of the metals in the precursor solutions. Data analysis is in progress. Figure 1 shows an example of the data obtained.

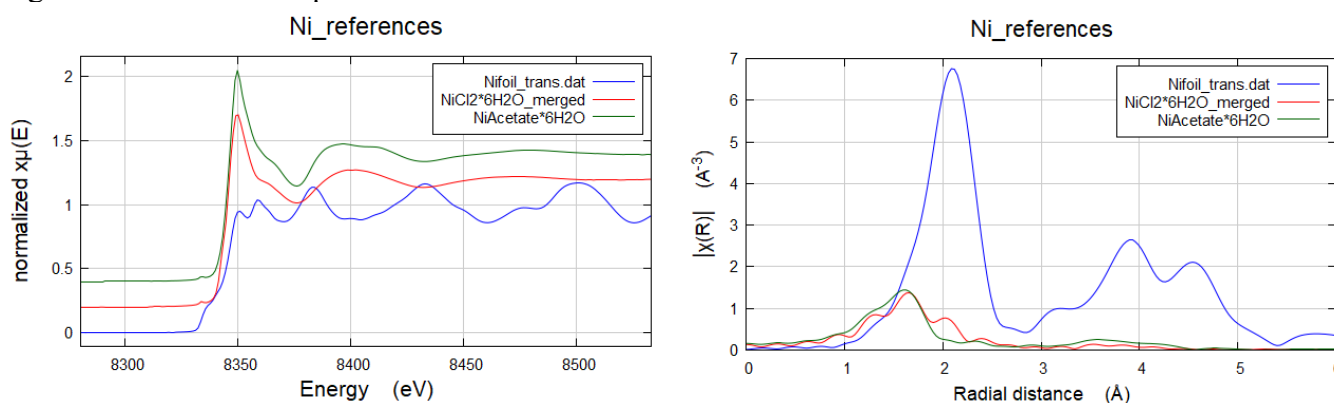


Figure 1a) XANES and EXAFS data of Ni references

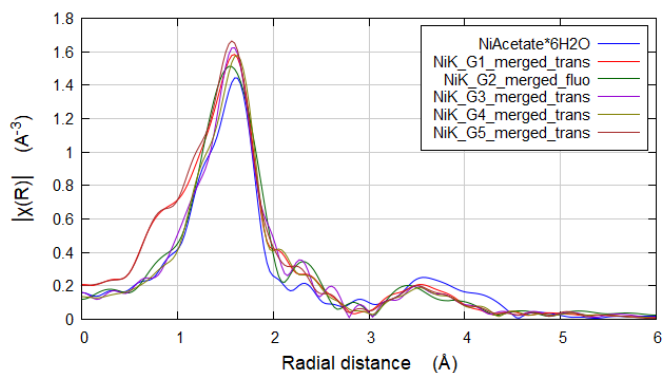


Figure 1b) EXAFS data of Ni uptake in various MOFs (G1-G5)

The data in the Figure 1b indicate that there is very little difference in the local environment of Ni adsorbed in various MOFs with presumable different adsorption sites. In addition, this environment resembles that in Ni acetate rather than NiCl₂ as in the parent solution.

Figure 2 shows slight variation in the local structure around Ni when adsorbed at different PH levels. Comparison with additives shows again different environment than that in the precursor solutions.

