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Mixed Iron Valences at Bacterial Surfaces From Hydrothermal Vents

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The atlantic shrimp *Rimicaris exoculata* seems to play an important role in iron dynamics at Atlantic hydrothermal sites. In this study, we have studied biomineralization associated to the epibionts of *Rimicaris exoculata*, collected at the Rainbow (Mid Atlantic Ridge) hydrothermal vent site. The structure, morphology and impurities distributions of the minerals were analyzed by Transmission electron microscopy and electron energy loss spectroscopy. The main minerals observed are clusters of two-lines ferrihydrite, found attached to the bacterial cells present in the gill chamber of the shrimp. EELS measurements at the Fe 2p excitation demonstrate that both 2+ and 3+ states are recorded from the ferrihydrite clusters. This anomalous behaviour of ferrihydrite might be related to its intimate mixing, at the nanometer scale, with Fe2+-bearing organic mater. The specific biomineralization mechanism might be a key to the stabilization of this phase.