

The results of the preliminary tests for validation of purge of ambient gas with argon as well as sample dehydration by heating each of them before the LIBS measurements are shown in Fig. S1. The first test was performed with a steel sample, and the result showed a negligible H I 656.28 nm line in the LIBS spectrum when the argon flow was gradually increased to 6 liters/min as shown in Fig. S1 (a). For the second test, a pure CaSO_4 pellet was measured before and after dehydration, the resulted spectra are shown in Fig. S1 (b), proving a good effectiveness of the dehydration process.

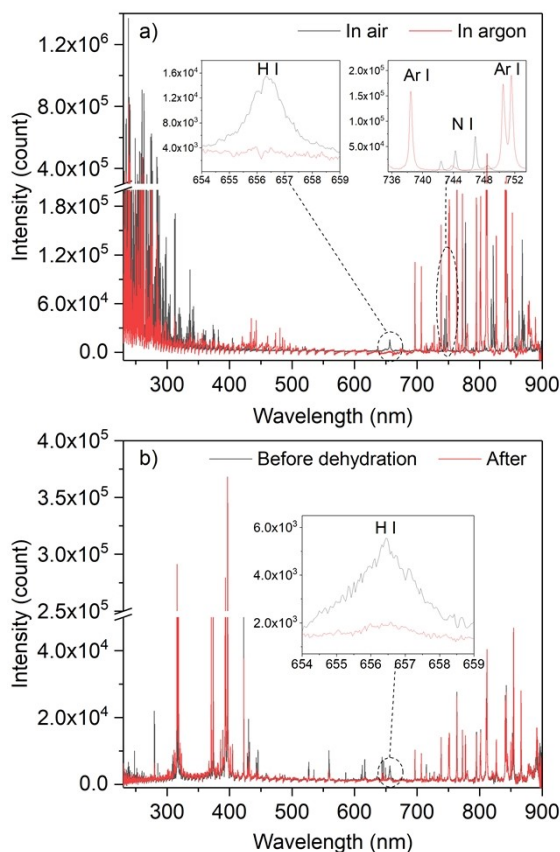


Fig. S1 (a) Raw spectra from a steel sample without Ar flow (black curve) and with an Ar flow at $6 \text{ L} \cdot \text{min}^{-1}$ (red curve), detailed displays show H I 656.28 nm line, N I (742.36, 744.23 and 746.83 nm) lines and Ar I (738.40, 750.39 and 751.47 nm) lines; (b) Raw spectra from a pure CaSO_4 pellet before dehydration (black curve) and after dehydration (red curve), the inset displays detailed spectra in the range around H I 656.28 nm line.