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Comparing the performance of CuO dispersive media for O₂ capturing in Liquid Argon

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In this work, we have explored the potential of oxygen capture in Liquid Argon (LAr) of the innovative CuO dispersive layered double hydroxide media (R-LDH) and the Ce-doped R-LDH. Low-temperature experiments in the LAr Purification Cryostat (PuLArC) at IFGW/Unicamp were performed using LAr circulation through two filters, one containing the R-LDH (or the Ce-doped R-LDH) material and the other the BASF commercial copper material (Cu-02265 - proposed as a reference O₂ getter media by Fermilab) for comparison. Interestingly, the experiments performed in PuLArC revealed that the R-LDH and Ce-doped R-LDH innovative medias were capable of capturing O₂ from recirculating LAr in PuLArC. For instance, the R-LDH media reduced the O₂ contaminants concentration to 80% of its initial values after 200 min of LAr circulation. As for the reference media BASF Cu-S0226, this media reduced the O₂ concentration to 40% of its initial value in the same time window. The performance/kg of the studied media will be compared and we will discuss the putative higher potential of the innovative Ce-doped and pure R-LDH media for O₂ capturing in LAr which may invoke further tests of these media in larger scale LAr cryostats, possibly at Fermilab and CERN.

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