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The development of the R-LDH Innovative media for O₂ Capturing in Liquid Argon

In this work, we have explored the potential of oxygen capturing in Liquid Argon (LAr) of the innovative CuO dispersive layered double hydroxide media (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 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 innovative media was capable of capturing O₂ from recirculating LAr in PuLArC, reducing 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. This result demonstrated a putative higher potential of the innovative R-LDH media for O₂ capturing in LAr and invoke further tests of this media in the PuLArC and in larger scale LAr cryostats, possibly at Fermilab and CERN.

Primary authors: MACHADO, Ana Amélia (Instituto de Física “Gleb Wataghin”, UNICAMP); Ms CAFFER, Ana Maria (UNICAMP); AUGUSTO, André (Equatorial sistemas S.A., Grupo Akaer); DOS SANTOS, Cezar Rodrigo Aguiar (Instituto de Física “Gleb Wataghin”, UNICAMP); Dr ADRIANO, Cris (Instituto de Física “Gleb Wataghin”, UNICAMP); Dr REIS, Cristhiane (University of São João del Rei); SOUZA CORREIA, Daniel (Brazilian Center for Research in Physics); MONTANARI, David (Fermi National Accelerator Laboratory); Dr CARDOSO, Dilson (Advanced Materials and Energy Research Center, Federal University of São Carlos); NORILER, Dirceu (School of Chemical Engineering, UNICAMP); Dr ASSAF, Elisabete (Advanced Materials and Energy Research Center, Federal University of São Carlos); Dr SEGRETO, Ettore (Instituto de Física “Gleb Wataghin”, UNICAMP); DEMOLIN, Frederico (Instituto de Física “Gleb Wataghin”, UNICAMP); Ms FREITAS, G. S. (Instituto de Física “Gleb Wataghin”, UNICAMP); WIEDERHECKER, Gustavo (Instituto de Física “Gleb Wataghin”, UNICAMP); Ms PIZZI, H. B. (Instituto de Física “Gleb Wataghin”, UNICAMP); FRANDINI, Heriques (Instituto de Física “Gleb Wataghin”, UNICAMP); Dr MAZALI, Italo O. (Instituto de Química - UNICAMP); CRUZ, Ivana (Advanced Materials and Energy Research Center, Federal University of São Carlos); Dr MANSUR ASSAF, José (Advanced Materials and Energy Research Center, Federal University of São Carlos); BRANT, Krystal (Brazilian Center for Research in Physics); Dr FONTES, Magda (Brazilian Center for Research in Physics); ADAMOWSKI, Mark (Fermi National Accelerator Laboratory); OLIVEIRA JR., N. F. (Instituto de Física, Universidade de São Paulo); Dr PAGLIUSO, P. G. (Instituto de Física “Gleb Wataghin”, UNICAMP); BIANCHI, Pedro (School of Chemical Engineering, UNICAMP); SOCCOL, Renato (School of Chemical Engineering, UNICAMP); Dr GONÇALVES, Rosembergue G. (Advanced Materials and Energy Research Center, Federal University of São Carlos); DOUBNIK, Roza (Fermi National Accelerator Laboratory); Dr ALEGRE, Thiago P. M. (Instituto de Física “Gleb Wataghin”, UNICAMP)

Presenter: Ms CAFFER, Ana Maria (UNICAMP)

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