Abstract Submitted
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Synthesis of scintillating metal organic frameworks for the detection of radiation from subatomic particles[1] CONRAD INGRAM, MICHAEL WILLIAMS, Clark Atlanta University — The objective of this research is to develop fluorescent metal organic frameworks (MOFs) as scintillation materials for more efficient light output and detection of ionizing radiation, such as neutrons, alpha particles or gamma rays, generated by fissile materials. MOFs are multidimensional porous structures, which are synthesized from the covalent bonding of metal ions or metal oxide clusters with organic ligand linkers, such as benzene dicarboxylates. The ligands will be chosen to have fluorescent characteristics, when excited by radiation or energetic sub-atomic particles. We will explore the synthesis of new MOFs, containing carboxylate ligands with unique conjugated chromophores, such as, benzene-1,3,5-triyltris(ethene-2,1-diyl)) tribenzoic acid and 9-hydroxy-9-vinyl-9H-fluorene-2,7-dicarboxylic acid), and doped with heavy metal as triplet-state harvesters, that we are proposing will result in stronger and possibly, unique luminescence spectral features that will allow for the discrimination between different ionizing radiations from subatomic particles. Photo-, catho- and radio-luminescence studies will be conducted on the materials, and radiation mechanism(s) will be investigated.

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