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Z. Assefa, and R.G. Haire

Oak Ridge National Laboratory, CASD, POBox 2008, MS 6375, Oak Ridge, TN 37831.

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THE NATURE OF SELF-LUMINESCENCE FROM EINSTEINIUM DOPED GLASS.*

Z. Assefa and R.G. Haire, Oak Ridge National Laboratory, CASD, P.O.Box 2008, MS 6375, Oak Ridge, TN 37831.

We have been conducting spectroscopic investigations of the transuranium elements in silicate matrices. Glasses doped with Es show a blue self-luminescence band having a maximum at ~ 450 nm, and minor bands at 650 and 730 nm. The blue emission is believed to originate from alpha-radiation induced defect centers involving oxygen displacements within the Si-O-Si network. Thus, the alpha radiation produces both defect sites, as well as electronic excitations in the matrix. With time, the intensity of the 450 nm band decreases, whereas the 650 and 730 nm bands increase. The latter bands are believed to originate from Si-micro cluster units representing large oxygen deficient centers. Details of these investigations and their significance will be presented. *Research sponsored by the Chemical Sciences Div., BES, U.S. DOE, under contract DE-AC0596OR22464 with Lockheed Martin Energy Research Corp.