

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Kr/Xe Separation over Metal Organic Framework Membranes – Colorado School of Mines

SECTION B. Project Description

The Colorado School of Mines proposes to establish a solid fundamental science program leading to the rational design of a novel family of membranes, composed of metal organic frameworks which offer the possibility of demonstrating high separation performance for Kr/Xe gas mixtures. Specific objectives include 1) the development of continuous and reproducible metal organic frameworks (MOF) membranes on porous tubular supports displaying high Kr permeabilities and high Kr/Xe separation selectivities, 2) demonstrating the membrane performance long-term stability, 3) establish the basic structure/separation relationships of MOF membranes in Kr/Xe separations, and 4) demonstrating that membrane synthesis could be amenable to large-scale production.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage / Chemical Waste Disposal – Chemicals will be used to prepare the membranes. The chemical waste (which will be generated in very small amounts) will be safely disposed according to the rules established by the Safety Department at CSM. This chemical waste is non-toxic.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of university-scale research aimed at investigating the development of metal organic frameworks membranes.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 06/17/2015