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Molecular and carbon isotopic variability of hydrocarbon gases from mud volcanoes in the Gulf of Cadiz, NE Atlantic

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Investigations of molecular and carbon isotopic variability of hydrocarbon gases from methane through butanes (pentanes) have been performed on six mud volcanoes from two fluid venting provinces located in the Gulf of Cadiz, NE Atlantic. The main aims were to define the basic gas types, to describe their geochemical characteristics in relationship to their sources, and to determine the secondary effects due to migration/mixing and microbial alteration. Hydrocarbon gas data reveal two groups of gases. Despite the different maturation characteristics, both gas groups are allochthonous to the erupted mud breccia and represent a complex of redeposited, secondary migrated, mixed, and microbially altered hydrocarbons. It may possibly imply the presence of hydrocarbon accumulations in the deep subsurface of the Gulf of Cadiz