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(54) Title: METHOD OF DESULFURIZATION OF FOSSIL FUEL WITH FLAVOPROTEIN

(57) Abstract

The invention relates to the discovery that the rate of reaction of the desulfurization of fossil fuels is enhanced by the addition of a flavoprotein to the biocatalyst. The invention is drawn to a method for enhancing the rate of desulfurizing a fossil fuel containing organic sulfur compounds, comprising the steps of: a) contacting the fossil fuel with an aqueous phase containing a biocatalyst capable of cleaving carbon-sulfur bonds and a rate-enhancing amount of a flavoprotein, thereby forming a fossil fuel and aqueous phase mixture; b) maintaining the mixture of step (a) under conditions sufficient for cleavage of the carbon-sulfur bonds of the organic sulfur molecules by the biocatalyst, thereby resulting in a fossil fuel having a reduced organic sulfur content; and c) separating the fossil fuel having a reduced organic sulfur content from the resulting aqueous phase. The invention also relates to a recombinant microorganism containing one or more recombinant DNA molecules which encode a biocatalyst capable of desulfurizing a fossil fuel containing organic sulfur molecules and which encode a flavoprotein. The invention also relates to a composition comprising (a) a biocatalyst capable of desulfurizing a fossil fuel containing organic sulfur molecules and (b) a flavoprotein.