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Hydrogen Sulfide Decomposition in Pulsed Corona Discharge Reactors S. JOHN, G.B. ZHAO, J.J. ZHANG, J.C. HAMANN, S.S. MUKNA-HALLIPATNA, S. LEGOWSKI, J.F. ACKERMAN, M.D. ARGYLE, University of Wyoming — Hydrogen sulfide (H_2S) decomposition was carried out in each of four balance gases (Ar, He, N_2 and H_2) in a wire-in-tube pulsed corona discharge reactor. H_2S conversion rates and H_2S decomposition energy efficiencies depend on the balance gas and H_2S concentrations. H_2S conversion in monatomic balance gases, like Ar and He, is more efficient than in diatomic balance gases like N_2 and H_2. Low pulse forming capacitance, low charge voltage, and high pulse frequency operation produces the highest energy efficiency for H_2S conversion at constant power. H_2S conversion is more efficient in Ar-N_2 gas mixture than in Ar or N_2. These results can be explained by corona discharge observations, the electron attachment reactions of H_2S and the proposed reaction mechanism of H_2S dissociation. The results reveal the potential for energy efficient H_2S decomposition in pulsed corona discharge reactors.

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