



Analyzing Carbohydrate-Based Regenerative Fuel Cells as a Power Source for Unmanned Aerial Vehicles (Paperback)

By Olek Wojnar

Biblioscholar, United States, 2012. Paperback. Condition: New. Language: English. Brand New Book. Based on current capabilities, we examine the feasibility of creating a carbohydratebased regenerative fuel cell (CRFC) as the primary power source for unmanned aerial vehicles (UAV) for long endurance missions where station keeping is required. A CRFC power system is based on a closed-loop construct where carbohydrates are generated from zooxanthellae, algae that create excess carbohydrates during photosynthesis. The carbohydrates are then fed to a carbohydrate fuel cell where electric power is generated for the UAV s propulsion, flight control, payload, and accessory systems. The waste products from the fuel cell are used by the zooxanthellae to create more carbohydrates, therefore mass is conserved in the process of power generation. The overall goal of this research is to determine if CRFCs should be explored further as a viable power source. Through simulations, a UAV is sized to determine if greater than 24 hour endurance flight is possible and these results are compared to UAVs using more traditional photocell based power systems. The initial results suggest that more research should be done in the development of CRFCs as a power system for long endurance UAVs. The final outcome...



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