

Small Fuel Cell System as a Power Source for Unmanned Aerial Vehicle

*T. G. Kim¹, H. C. Shim¹, #S. J. Kwon(trumpet@kaist.ac.kr)¹

Key words : Fuel cell, Unmanned aerial vehicle, Power source, Hydrogen production, Sodium borohydride

1. 1910 1
200 가
2 가
320 K
80
100%
20 W PEM
(polymer electrolyte membrane) 가
NaBH₄ blended wing-body 가

NaBH₄ 가 PTFE
25% NaBH₄, 5% NaOH, 70% H₂O Fig. 1 20
ml/h 가
NaBH₄ 가
가 가 가 가
가 가

(Table. 1)

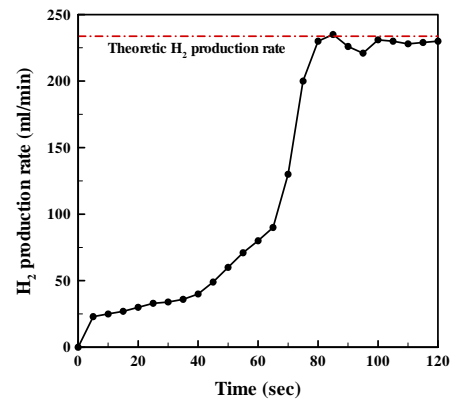


Fig. 1 Hydrogen production rate as a function of reaction time

Table 1 Comparison of UAV power sources

Power source	Advantages	Disadvantages
Internal engine	High power	Low efficiency Vibration & Noise
2 nd battery	Silence Simplicity	Low energy density Short duration Environment issue Rechargeable problem
Fuel cell	Long run-time	High cost

3. Fig. 2
20 W PEM
10 cm² 20
MEA 가
NaBH₄
Fig. 3
Fig. 4
가
60%
17.6%
Fig. 5
가

[1].



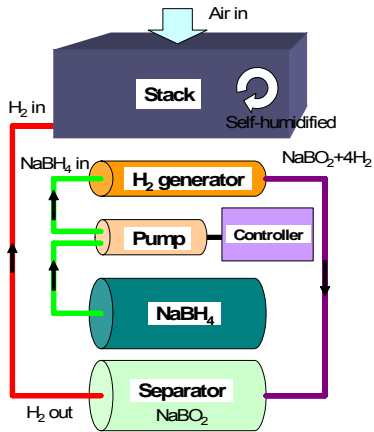


Fig. 2 Layout of fuel cell power system

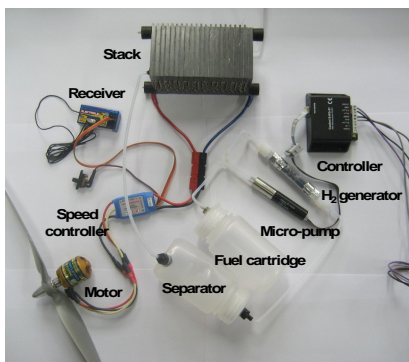


Fig. 3 Components of fuel cell system

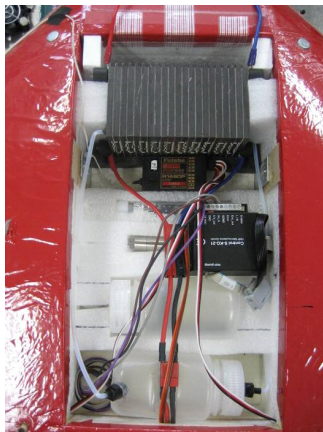


Fig. 4 Integration of fuel cell system into UAV

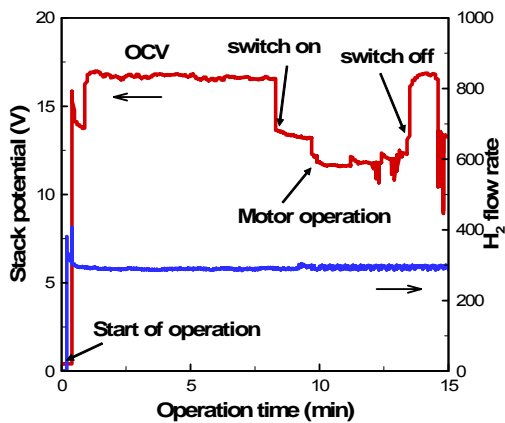


Fig. 5 Operation of electric motor with fuel cell system

4. Fuel cell UAV

wing flying
30% flying wing 가

Fig. 6

flying wing BWB (Blended Wing-Body) BWB UAV
Lithium-Polymer UAV
[2, 3].



Fig. 6 Blended Wing Body-type UAV Test bed

4.

NaBH₄, 20 W

가

MEMS

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