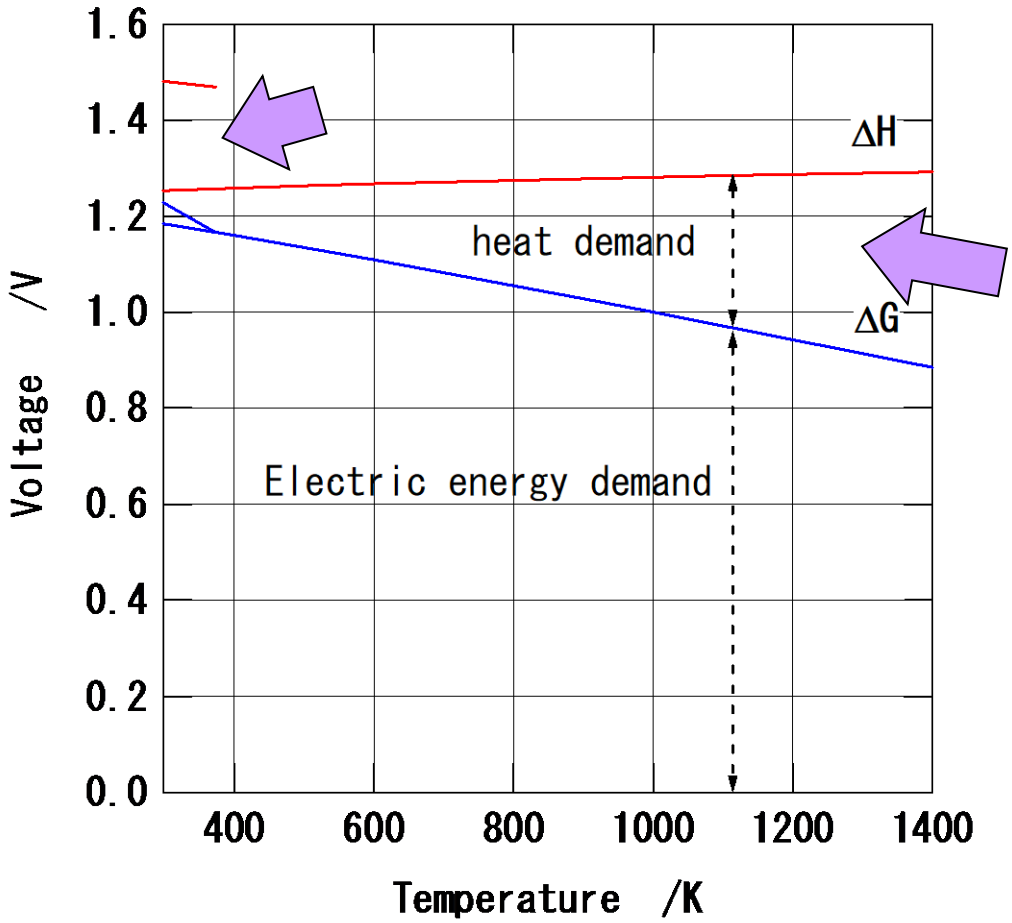


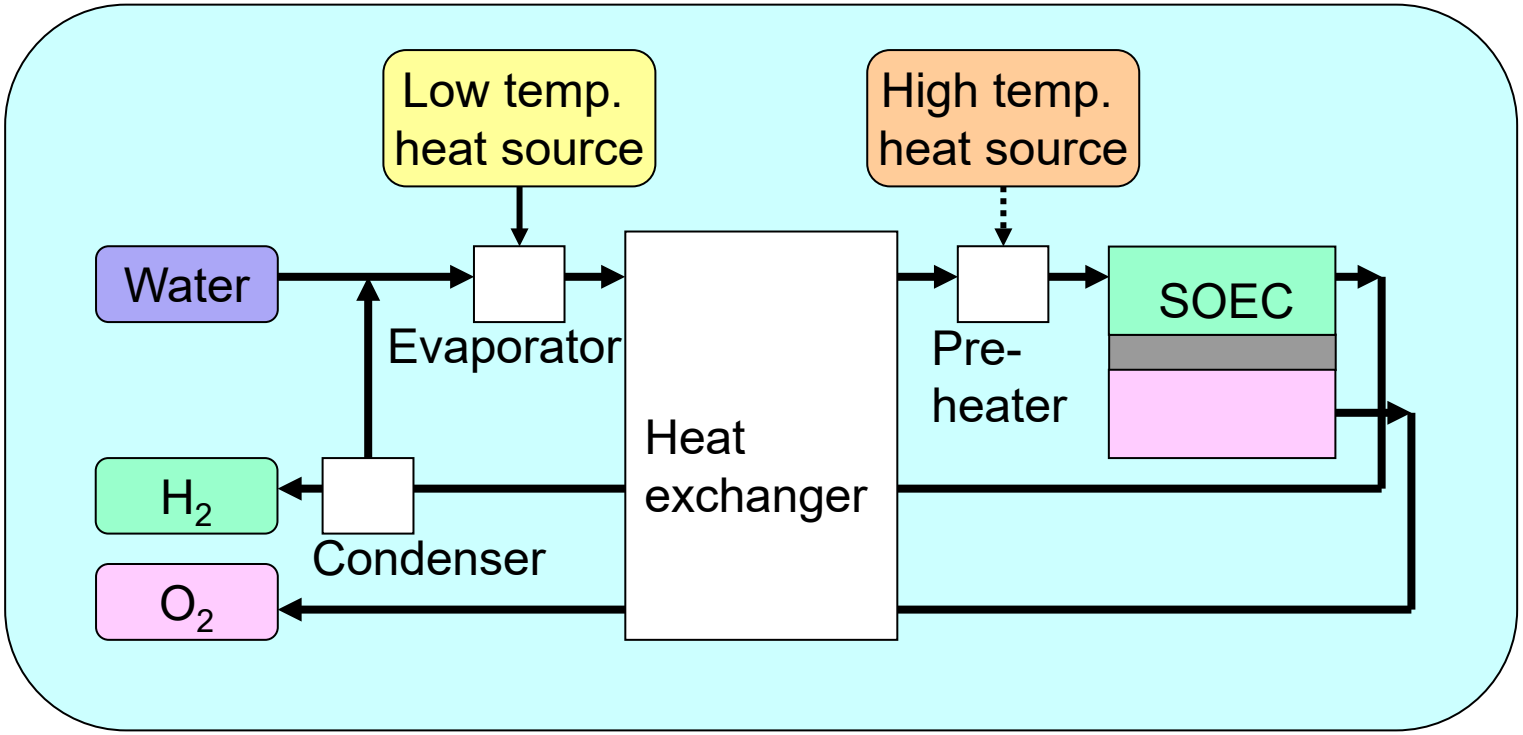
ΔH(T) and ΔG(T) of steam electrolytic reaction at 1 bar

1. The operating voltage of conventional water electrolysis cells is more than 1.6 V. On the other hand, the operating voltage of SOEC is less than 1.3 V.

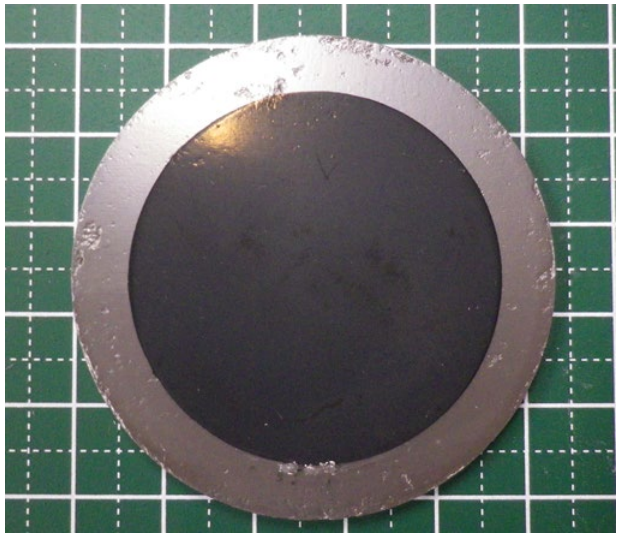
2. SOEC can utilize the heat generated by the internal resistance of the SOEC for the endothermic reaction of electrolysis effectively .

3. If there is the system which can supply high temperature heat around SOEC, SOEC can also utilize the high temperature heat from the system.

4. SOEC can utilize low temperature heat from outside for generating steam too.

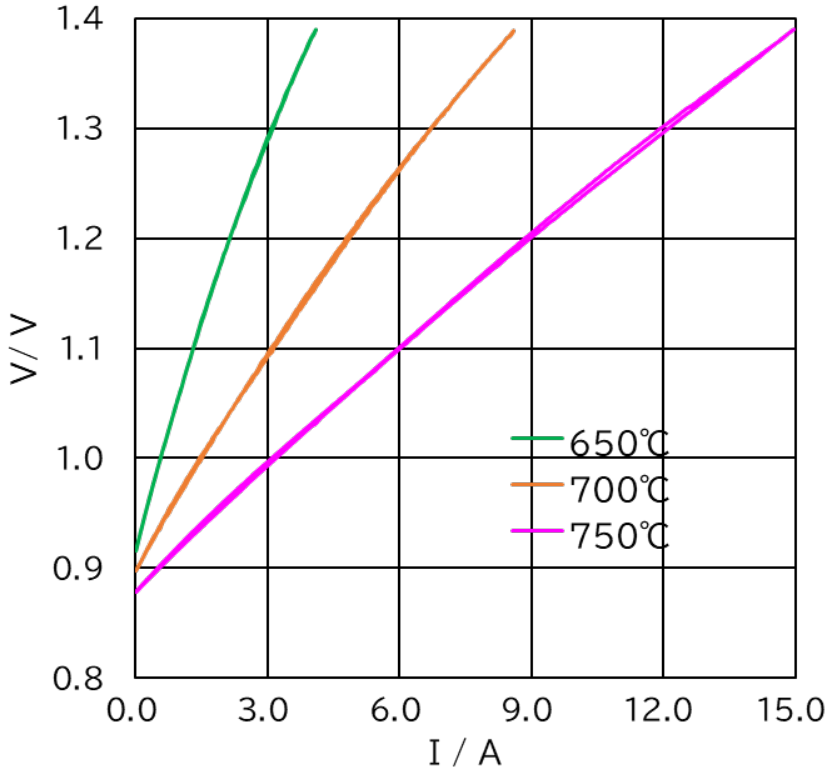

Low temp.
heat source
High temp.
heat source
Water
Evaporator
Heat
exchanger
Pre-
heater
SOEC
H_2
Condenser
O_2

高耐久性、高電流密度SOECの開発
Development of SOECs with long durability and high current density



円盤型SOEC（電極面積12.56cm^2）の試作

Fabrication of disk type SOECs. (area of positive electrode : 12.6 cm2)



円盤型セルの電解特性

電解効率110%で1A/cm^{2}以上の電流密度（at 750℃）を達成

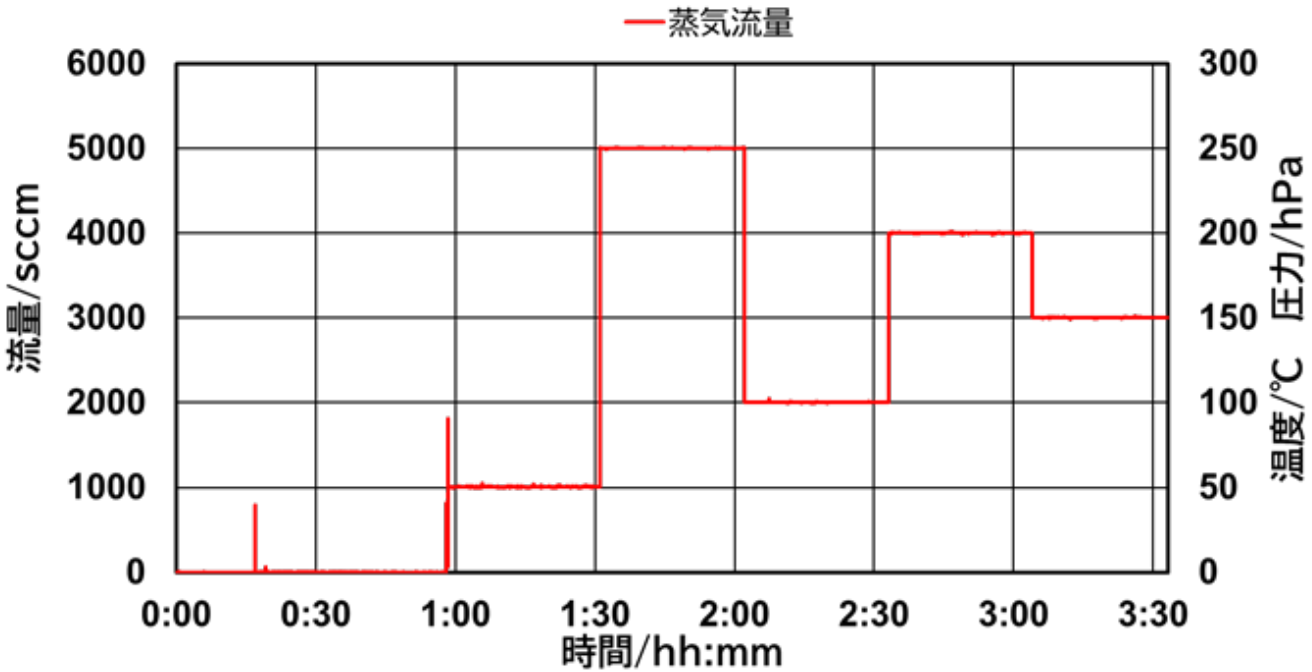
Electrolytic characteristics of the disk type SOEC.

Current density more than 1 A/cm2 with 110% electrolysis efficiency was achieved at 750 ℃

柔軟・高精度な水蒸気供給技術の開発

Development of flexible and high accurate steam supply control technology

・原料である水蒸気を少量（100sccm～5SLM）高精度、安定、柔軟に発生する技術の開発
Development of technology which supplies small amount of steam (100 sccm ～ 5 SLM) with high accuracy, stability and flexibility.



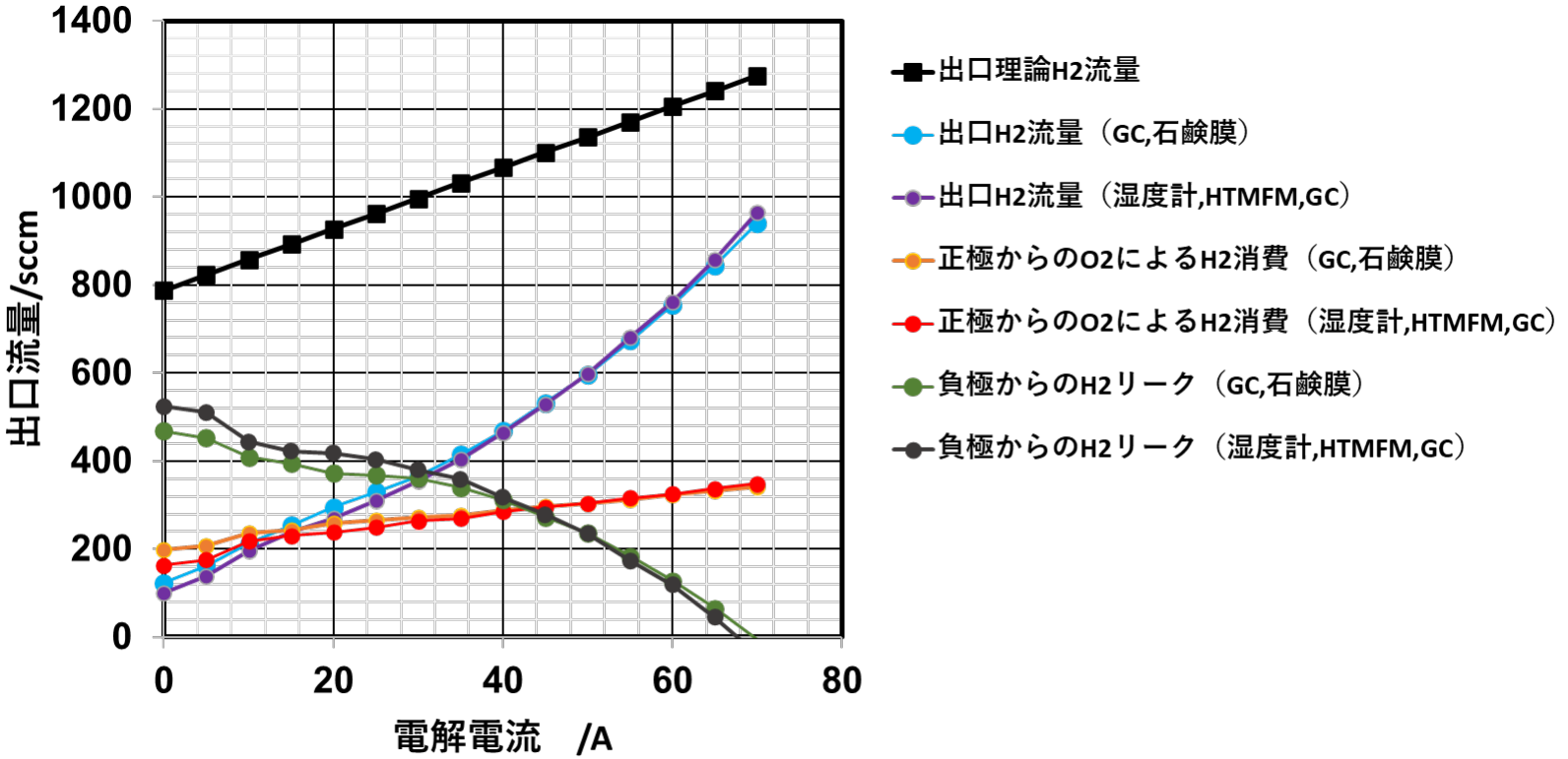
迅速・柔軟な水蒸気供給制御の例

Flexible steam supply control

SOECスタック性能評価技術の開発

Development of SOEC stack performance evaluation technology

・セルからのガスリークを正確に測定する技術の開発
Development of technology to measure gas leakage from SOECs accurately.



異なる2つの手法により水素生成量、水素リーク量測定の妥当性確認

Confirmation of validity of hydrogen production rate and hydrogen leakage measurement by two different methods.

ご質問等がある場合は以下までご連絡ください。

省エネルギー研究部門　　嘉藤　徹

〒305-8568
茨城県つくば市梅園1-1-1　中央第2
E-mail：M-info_soec-ml@aist.go.jp