

- 68(2): 161–71. [https://doi.org/10.1016/S0306-2619\(00\)00056-8](https://doi.org/10.1016/S0306-2619(00)00056-8)
- [7] Yang S, Qian Y, Wang Y, Yang SY. (2017). A novel cascade absorption heat transformer process using low grade waste heat and its application to coal to synthetic natural gas. *Applied Energy* 202: 42–52. <https://doi.org/10.1016/j.apenergy.2017.04.028>
- [8] Martínez H, Rivera W. (2009). Energy and exergy analysis of a double absorption heat transformer operating with water/lithium bromide. *International Journal of Energy Resources* 33(7): 662-674. <https://doi.org/10.1002/er.1502>
- [9] Donnellan P, Byrne E, Oliveira J, Cronin K. (2014). First and second law multidimensional analysis of a triple absorption heat transformer (TAHT). *Applied Energy* 113: 141-151. <https://doi.org/10.1016/j.apenergy.2013.06.049>
- [10] Ziegler F, Brandl F, VoÈ lkl J, Alefeld G. (1985). A cascading two-stage sorption chiller system consisting of water- zeolite high temperature stage and a water-LiBr low temperature stage. *Absorption Heat Pump Congress, Paris*.
- [11] Stitou D, Spinnera B, Satzgerb P, Ziegler F. (2000). Development and comparison of advanced cascading cycles coupling a solid/gas thermochemical process and a liquid/gas absorption process. *Applied Thermal Engineering* 20(14): 1237-1269. [https://doi.org/10.1016/S1359-4311\(99\)00053-8](https://doi.org/10.1016/S1359-4311(99)00053-8)
- [12] Kanea M, Larraina D, Favrata D, Allanib Y. (2003). Small hybrid solar power systems. *Energy* 28(14): 1427-1443. [https://doi.org/10.1016/S0360-5442\(03\)00127-0](https://doi.org/10.1016/S0360-5442(03)00127-0)
- [13] Mathieu A. (2012). Contribution to the design and thermodynamic optimization of a thermo-electric microcentral. Thesis, EMMA Doctoral School. University of Lorraine.
- [14] Tocci L, Pal T, Pesmazoglou I, Franchetti B. (2017). Small Scale Organic Rankine Cycle (ORC): A techno-economic review. *Energies* 10(4): 1-26. <https://doi.10.3390/en10040413>
- [15] Grenier P, Meunier F, Pons M. (1982). Les différentes possibilités d'application du couple zéolithe 13X-H2O pour le froid solaire en fonction du type de captation de l'énergie solaire. I.I.F.-I.I.R.-Commission E1-E2-Jerusalem, p. 20207, (1982/3).
- [16] Schuster A, Karellas S, Aumann R. (2010). Efficiency optimization potential in supercritical organic Rankine cycles. *Energy* 35(2): 1033-1039. <https://doi.org/10.1016/j.energy.2009.06.019>
- [17] Quoïlin S, Sébastien D, Tchanche BF, Lemort V. (2011). Thermo-economic optimization of waste heat recovery Organic Rankine Cycles. *Applied Thermal Engineering* 31(14): 2885-2893. <https://doi.org/10.1016/j.applthermaleng.2011.05.014>
- [18] Castaing-Lasvignottes J. (2001). Aspects thermodynamiques et technico-économiques des systèmes à absorption liquide, Institut Français du froid industriel.
- [19] Kherris S, Zebbar D, Makhlof M. (2014). Contribution à l'optimisation des installations

frigorifiques à absorption solaire. Éditions Universitaires Européennes, ISBN: 978-3-8417-8635-7.

- [20] Zebbar D, Kherris S, Mostefa S, Horr S, Guettaf M. (2016). Étude théorique du cycle de Brayton irréversible avec régénération d'une centrale thermique à concentration solaire. *Revue des Energies Renouvelables* 19(2): 199-210.

NOMENCLATURE

COP	Coefficient of performance
T	Temperature, K
T _m	Average temperature
P	Pressure, Pa
F	Recirculation flow ratio
h	Enthalpy, kJ kg ⁻¹
ṁ	Mass flux rate, kg S ⁻¹
ORC	Organic Rankine Cycle
PPC	Power plant configuration
Q	Heat rate, kJ S ⁻¹ or kW
ΔT	Approach temperature in heat exchangers, °C
Ẇ	Mechanical work rate, kJ s ⁻¹ or kW
ΔX _{ab}	Concentration difference between weak and strong absorbent
X _p	Absorbent weak concentration
X _r	Absorbent strong concentration

Greek symbols

ε	Heat exchanger efficiency
η	First law (or energy) efficiency
μ	Overall efficiency
Σ	Total

Subscripts

AbHT	Absorbtion heat transformer
AdHT	Adsorbtion heat transformer
C1	Condenser of the absorption heat transformer
C2	Condenser of the adsorption heat transformer
E1	Evaporator of the absorption heat transformer
E2	Evaporator of the adsorption heat transformer
G1	Desorber of the absorption heat transformer
G2	Generator of the adsorption heat transformer
HX	Heat exchanger
in	Input
is	Isosteric
PPC	Power plant configuration
rev	Reversible
SC	Solar collector
S1	First configuration
S2	Second configuration
u and U	Upgraded
out	Output
U1	Absorber of the absorption heat transformer
U2	Absorber of the adsorption heat transformer
Ẇ _p	Mechanical pump
1,2,3,...	State points.