Thermal propagation

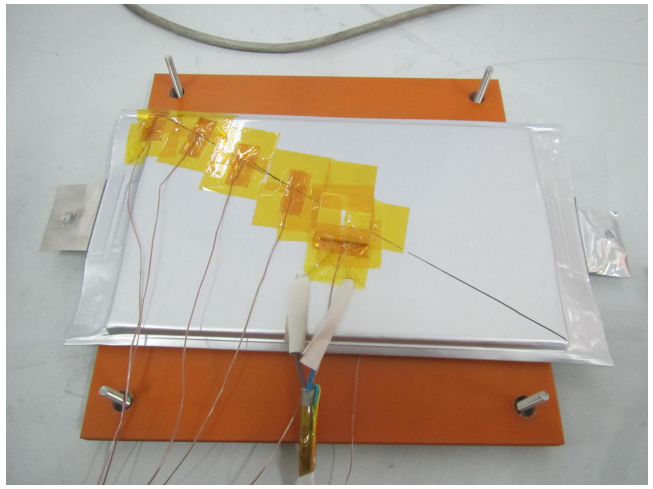
China
2019.12

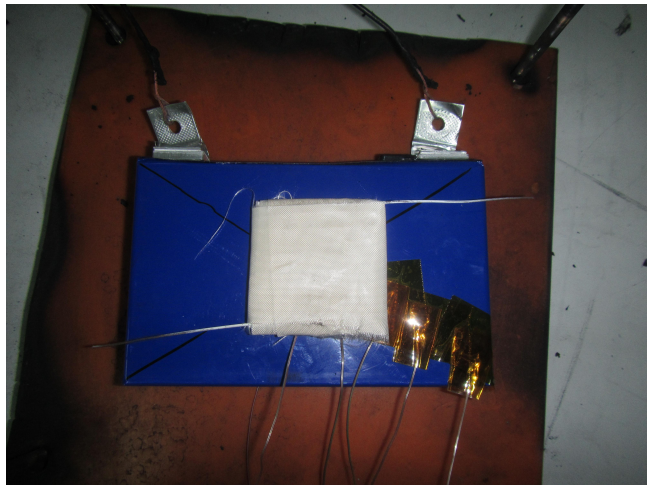
Contents

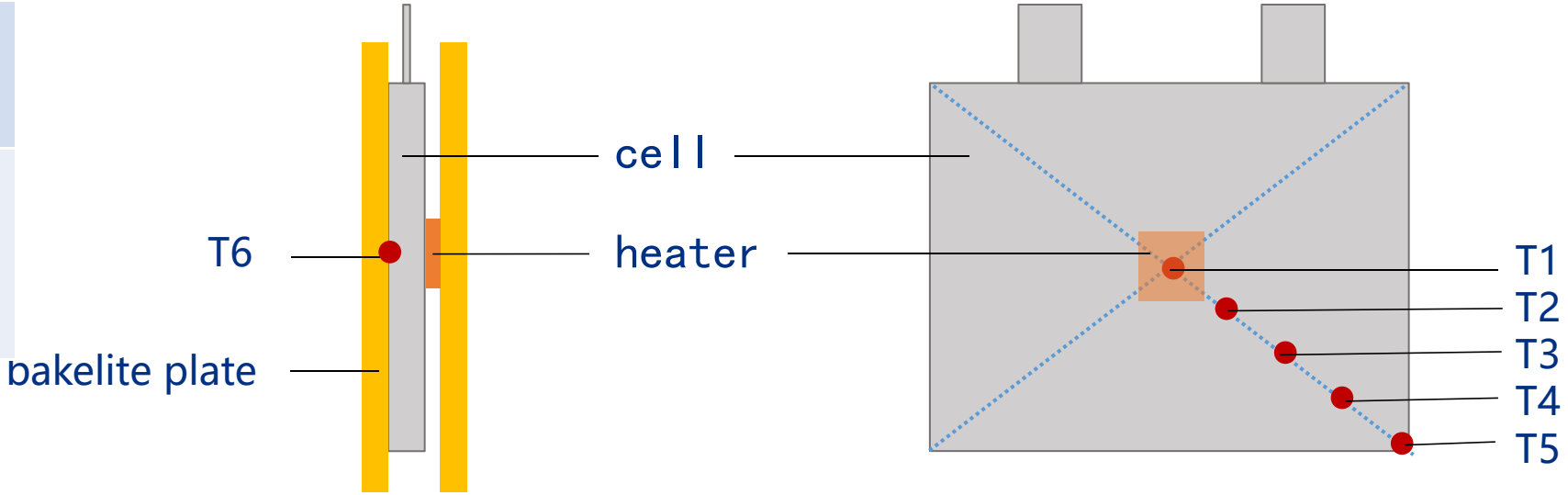
- The influence of different heating power on the triggering of thermal runaway
- The influence of different heating area on the triggering of thermal runaway

Research on heating power

Parameter	pouch	Prismatic
50*50*4 300W	√	√
50*50*4 600W	√	√
50*50*4 900W	√	√
100*100* 4 900W	√	√

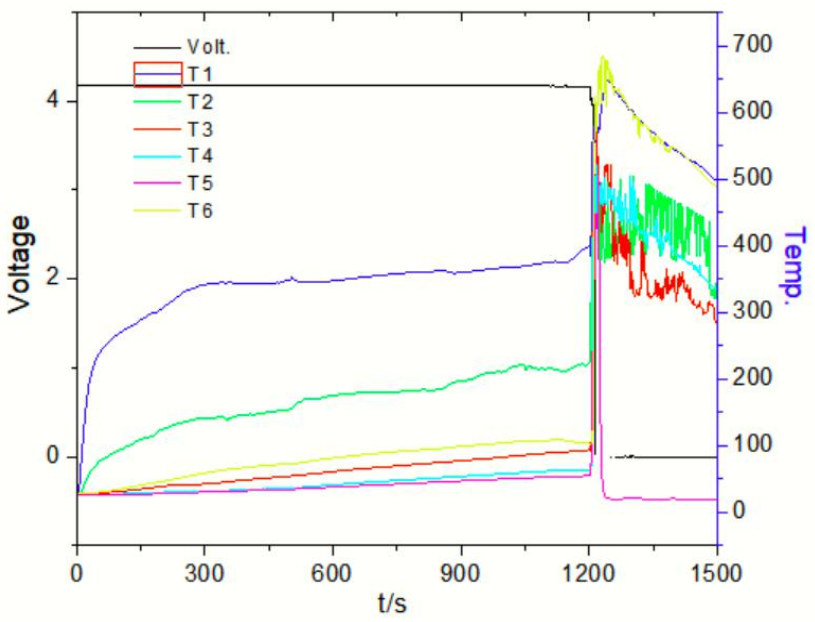




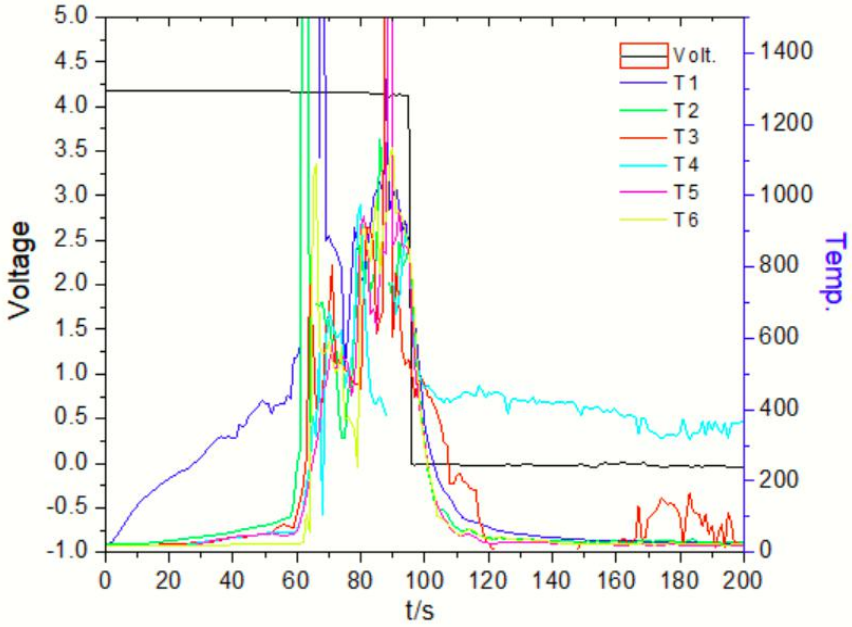


Research on heating power

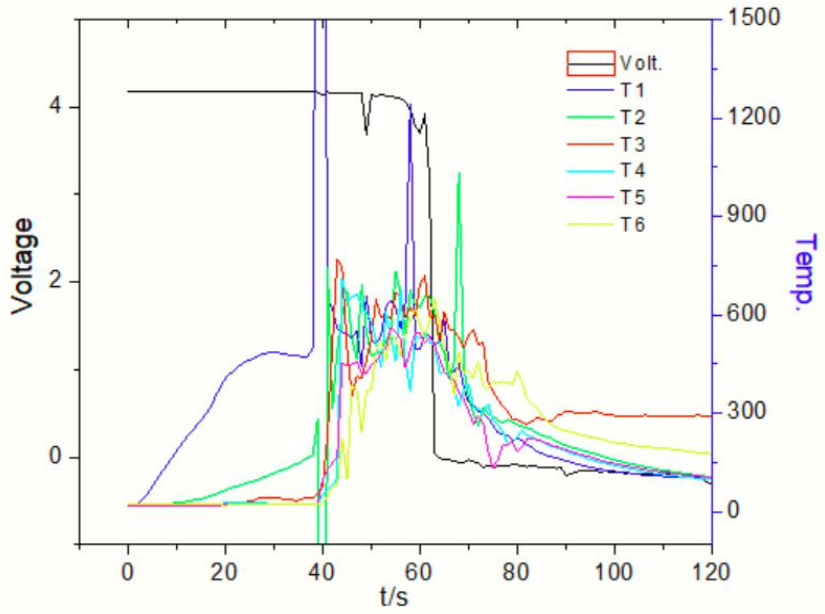
- **Pouch cell**
  Cell rated energy： 699840J



300W heating 25cm²
Heating time： 1205s
Introduced enery： 307500J
43.9%



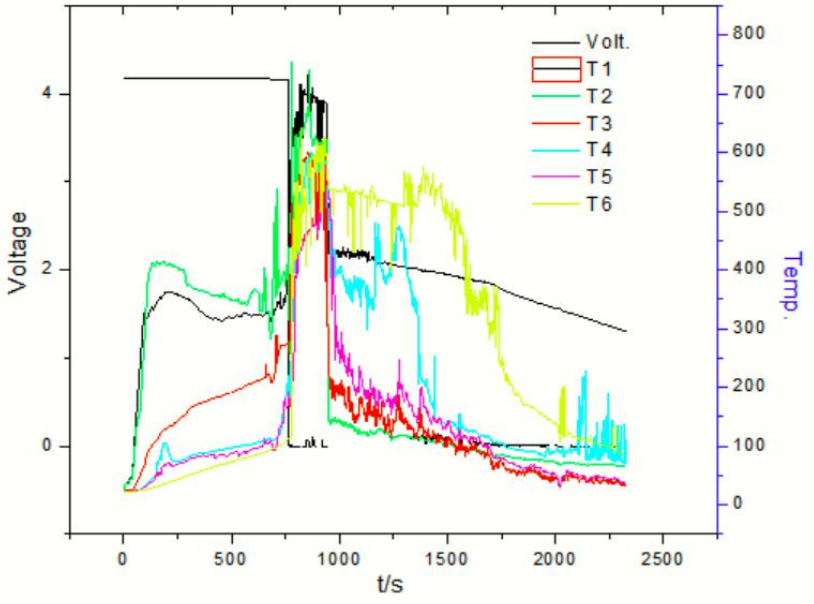
600W heating 25cm²
Heating time： 95s
Introduced enery： 57000J
8.1%



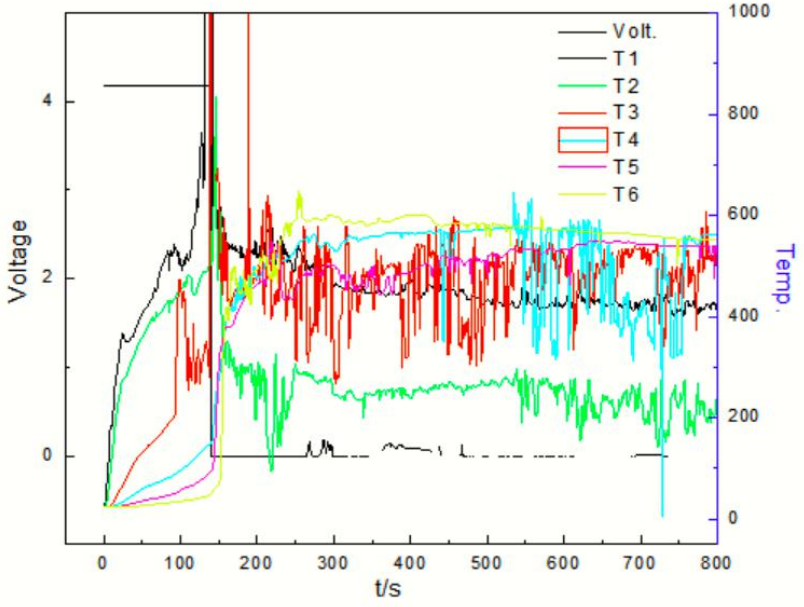
900W heating 25cm²
Heating time： 63s
Introduced enery： 56700J
8.1%

Research on heating power

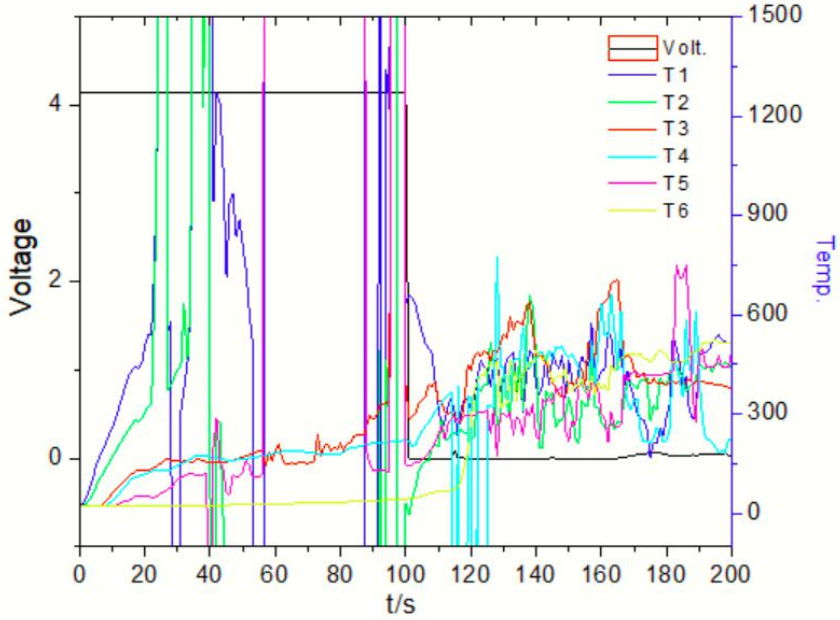
- **Prismatic cell**
  Cell rated energy： 544320J



300W heating 25cm²
Heating time： 764s
Introduced enery： 229200J
42.1%



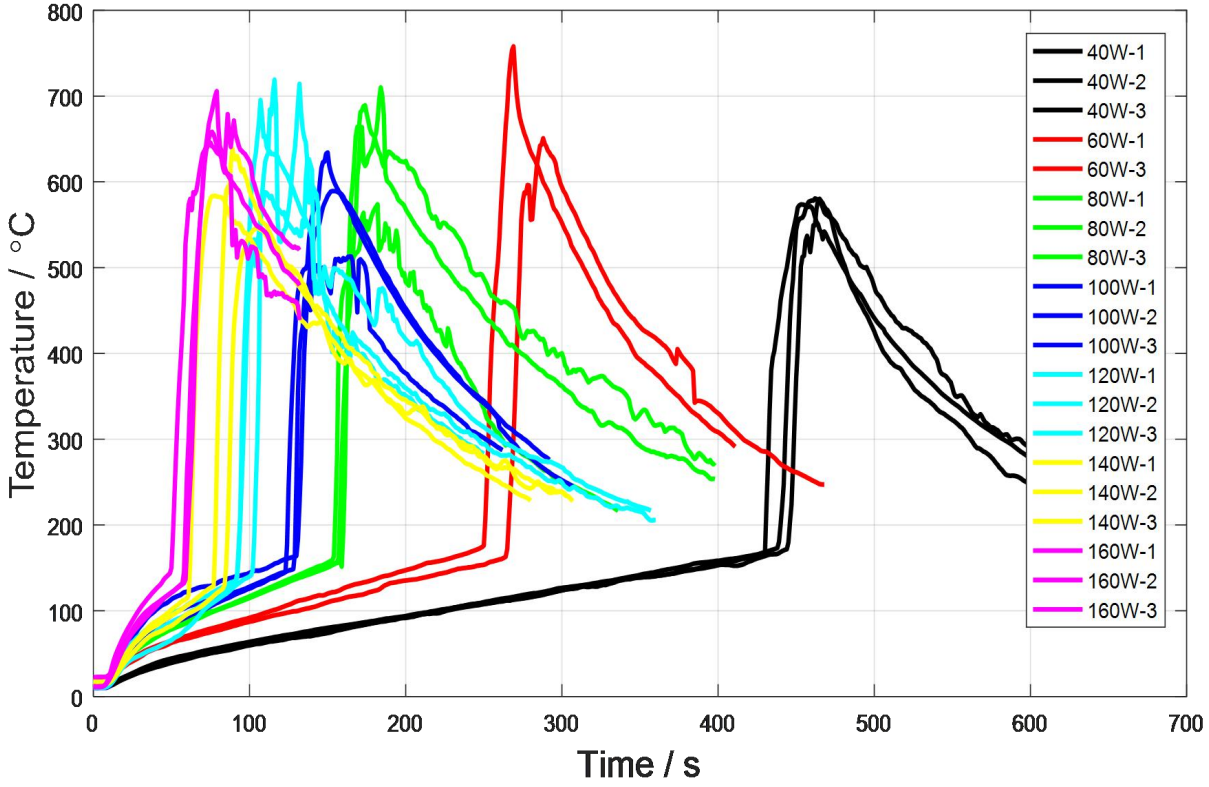
600W heating 25cm²
Heating time： 139s
Introduced enery： 83400J
15.3%



900W heating 25cm²
Heating time： 100s
Introduced enery： 90000J
16.5%

Research on heating power

- **Cylindrical cell**
  Cell rated energy： 59940J

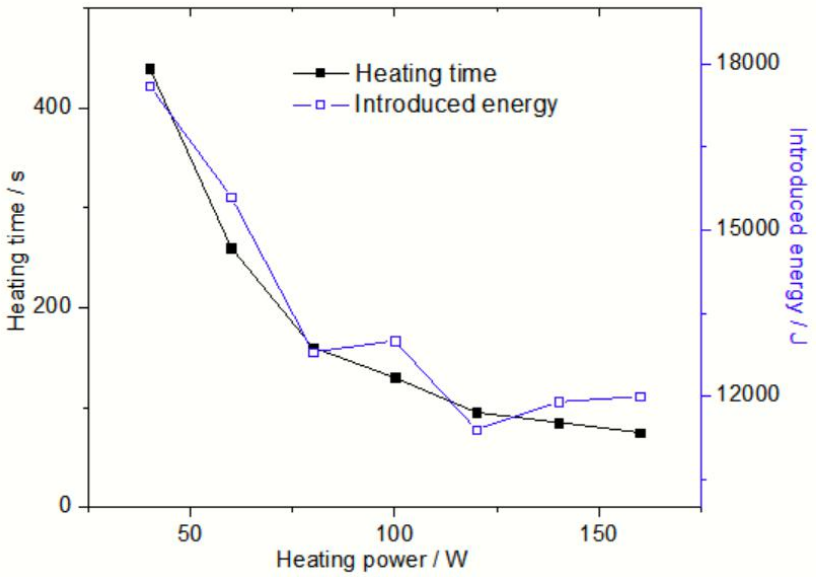


heating power(W)	heating time(s)	introduced energy(J)
40	440	17600
60	260	15600
80	160	12800
100	130	13000
120	95	11400
140	85	11900
160	75	12000

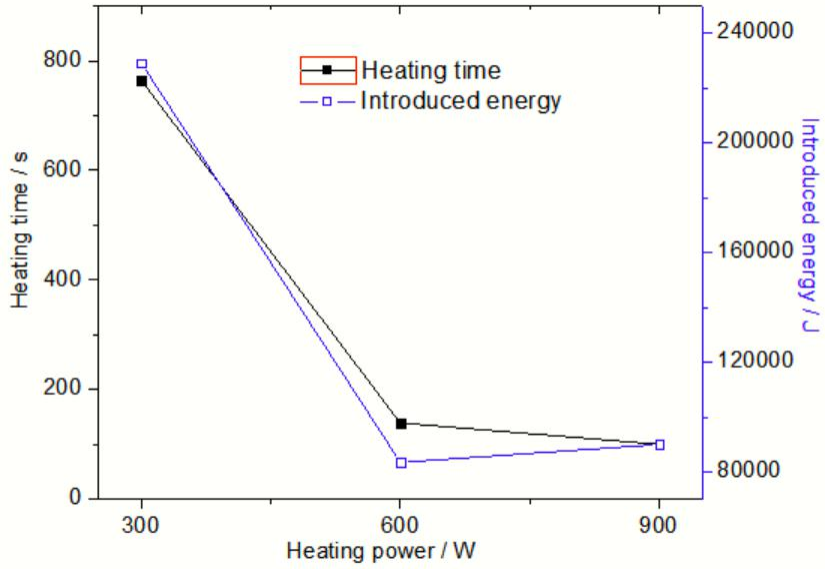
Research on heating power

➢ Summary

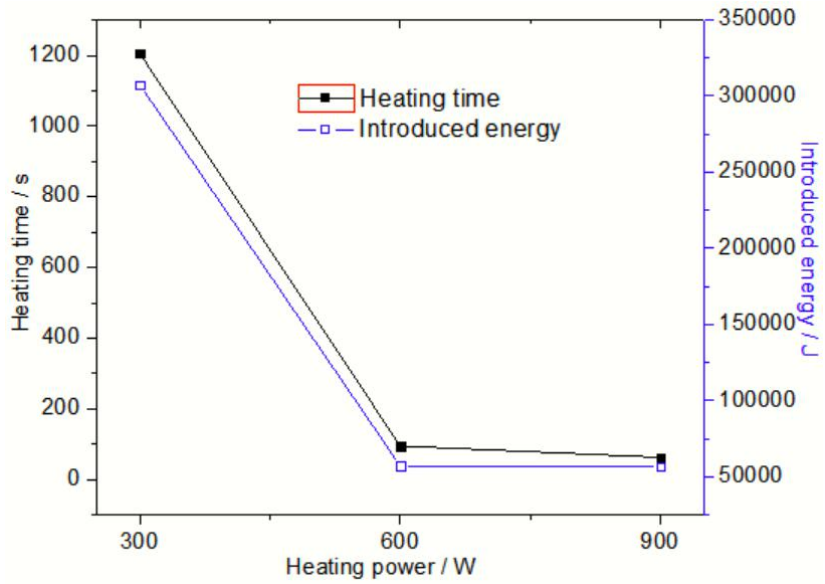
Increasing the heating power in a certain range has a significant effect on reducing the heating time and the introduced energy. When the power is high enough, increasing heatingpower has little effect on reducing the introduced energy.



Cylindrical cell



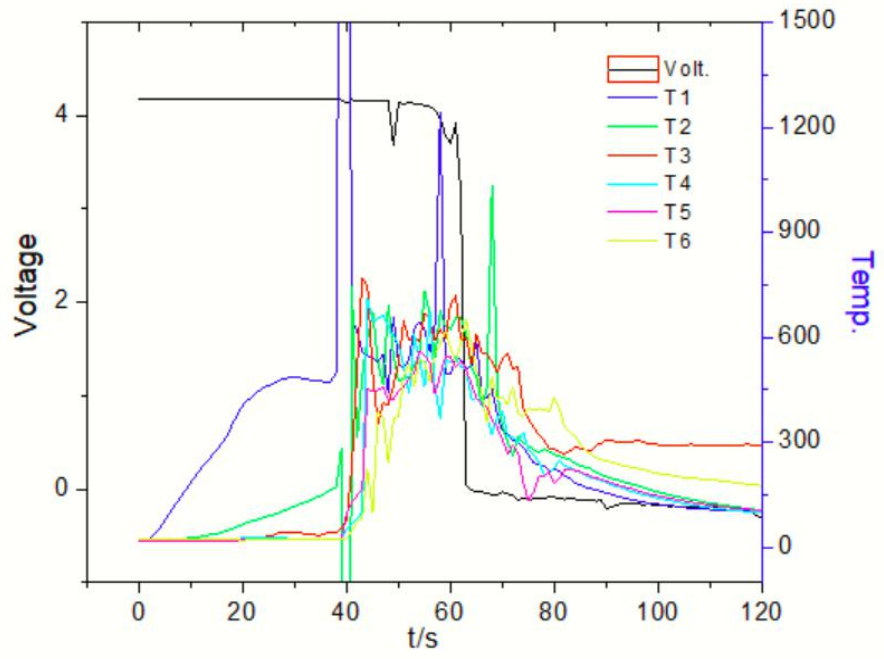
Prismatic cell



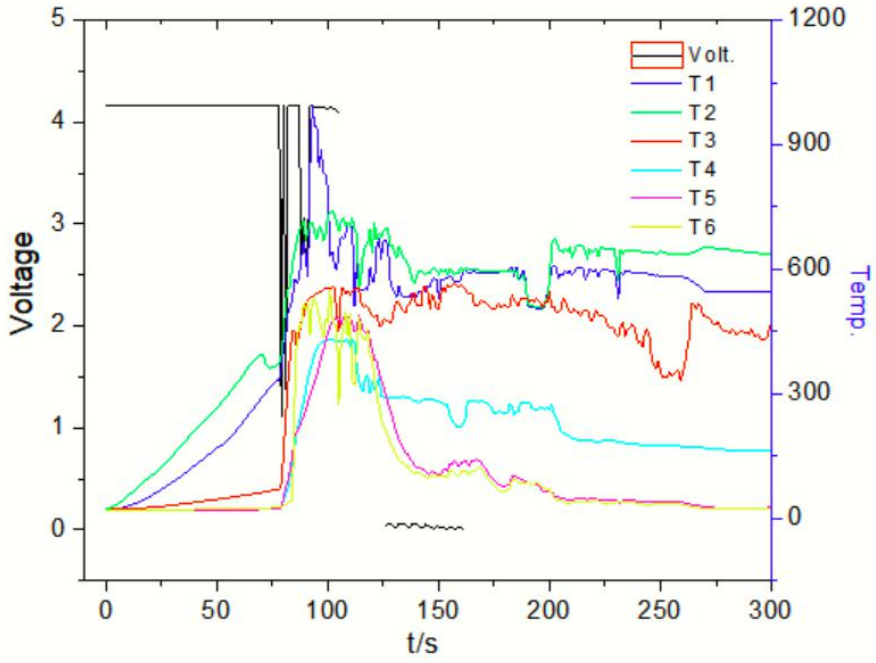
Pouch cell

Research on heating area

- **Pouch cell**
  Cell rated energy： 699840J



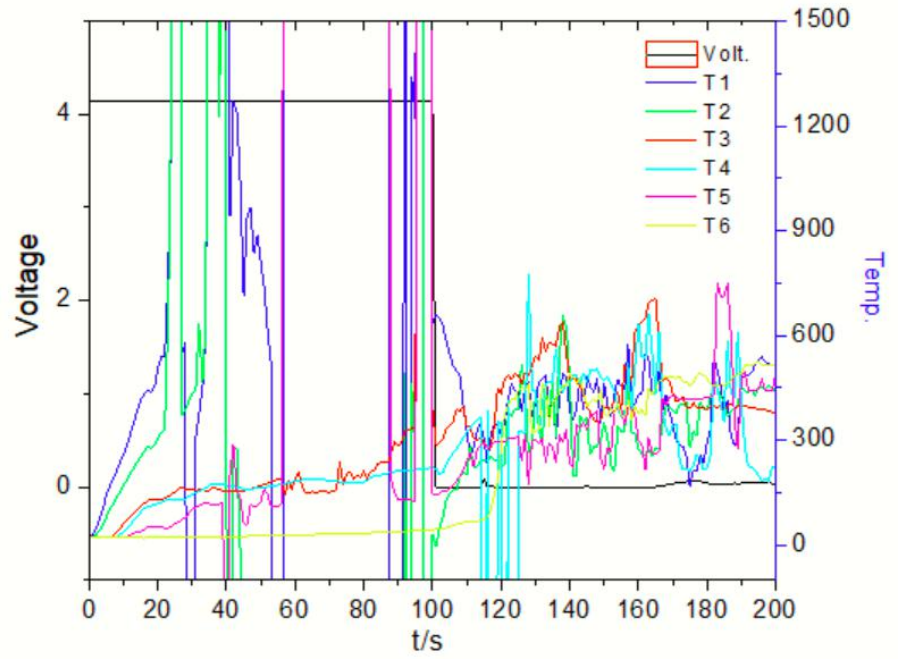
900W heating 25cm²
Heating time： 63s
Introduced enery： 56700J
8.1%



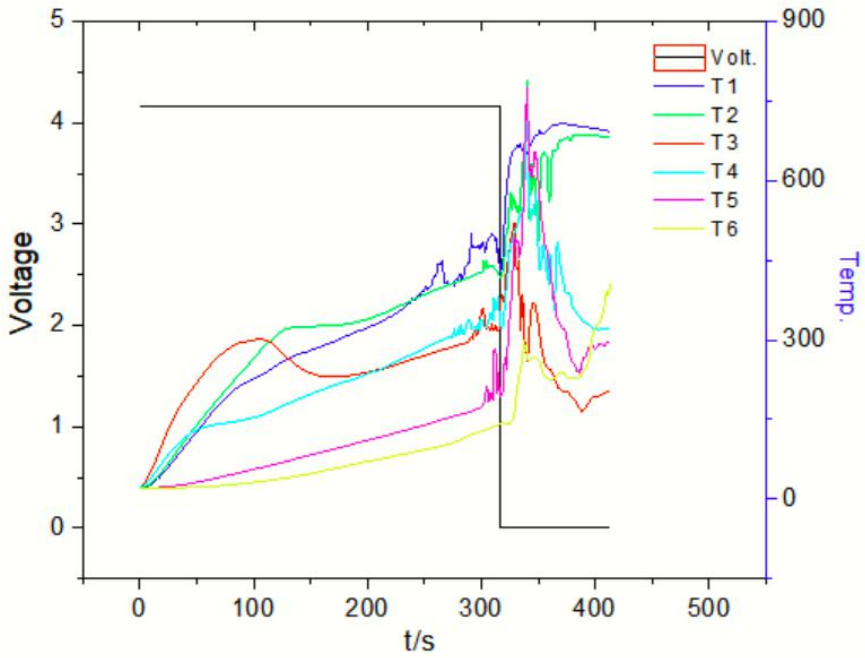
900W heating 100cm²
Heating time： 105s
Introduced enery： 94500J
13.5%

Research on heating area

- **Prismatic cell**
  Cell rated energy： 544320J



900W heating 25cm²
Heating time： 100s
Introduced enery： 90000J
16.5%



900W heating 100cm²
Heating time： 316s
Introduced enery： 284400J
52.2%

Research on heating area

➢ Summary

- For pouch and prismatic cells, the heating power of 900W with 25cm² heating area can trigger thermal runaway within 2min, and keep the introduced energy below 20% of the rated energy.
- Under the same heating power, the smaller heating area will trigger thermal runaway faster, so the energy introduced into the system will be lower.
- Prismatic cells is more sensitive to the change of heating area than pouch cells.

Thanks for your attention!