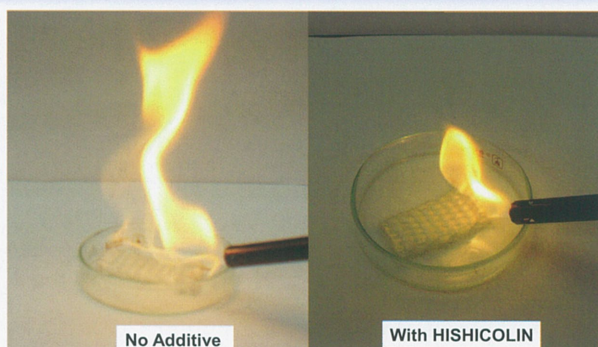


Phosphazene Flame-Retardant Additives for Non-Aqueous Electrolyte

HISHICOLIN®

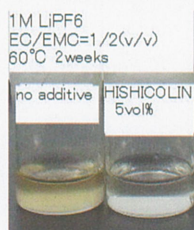


Properties of HISHICOLIN®

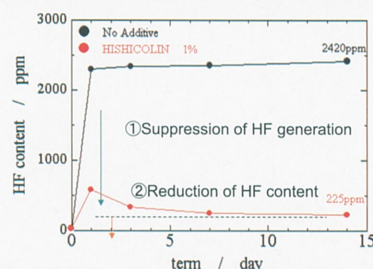
- High Flame-Retardant Ability... At the addition of only 5 - 10 vol.% .
- High Voltammetric Stability... Available for various active materials.
- High Thermal Stability... Stable at 80°C for a year.
- High Purity... Quality control by excellent manufacturing technology
- HISHICOLIN® is liquid at temperature from under -50°C to over 100°C and generates excellent compatibility with non aqueous electrolyte.

HISHICOLIN® have the excellent properties other than the flame retardant effect for electrolyte.

The effect of degradation control for the electrolyte

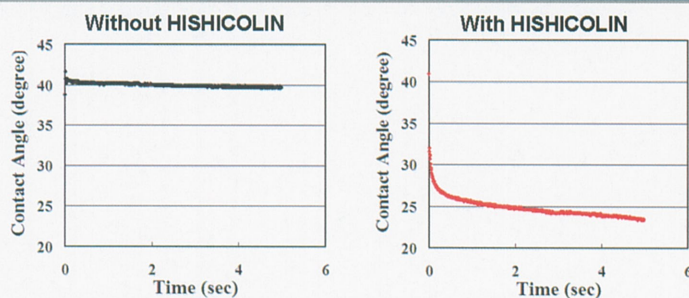


Coloring test of electrolyte at the higher temp. storage condition



Change in HF content up to 15 days after the addition of H₂O(1,000ppm) to the electrolyte.

Improvement of the wettability



Wetting ability test (contact angle)

Suppression of the swelling



BEFORE TEST HISHICOLIN10% +7.4ml Without HISHICOLIN +16.5ml

Overcharge test (5V)
NMC/C 1M LiPF₆ EC/EMC/DMC
Cell size 88 × 61 × 1(mm)



NIPPON CHEMICAL INDUSTRIAL

Headquarter: 11-1, 9-Chome, Kameido, Koto-ku, Tokyo. 136-8515
USA Office: 1311 Mamaroneck Avenue, Suite 145, White Plains, NY 10605
Please visit: <https://www.nippon-chem.co.jp/>