Technical Communication

(vol.04)

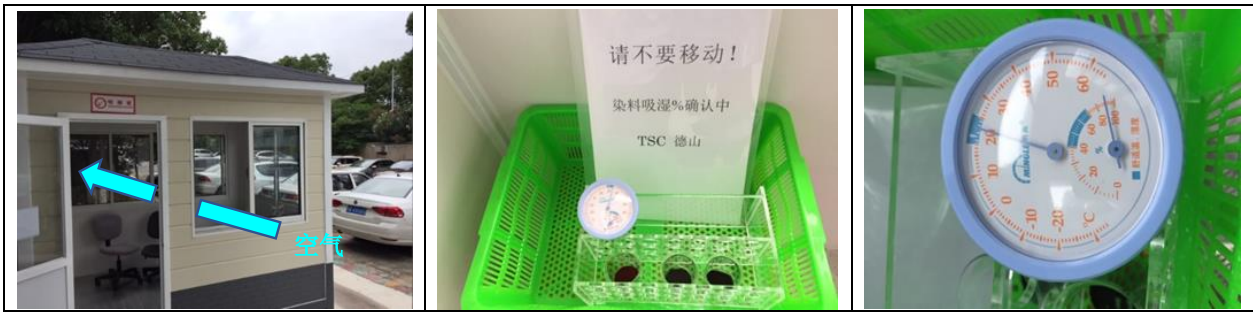
Nippon Kayaku (Thailand) CO., LTD.
Technical Service Center

「Moisture Absorption of dyestuff」

- A certain customer reported an increase in dye concentration compared to the previous box of the same dye despite having the same lot no.
- These problems can be attributed to non-ideal storage of dyes, where the dyes are exposed to moisture for long periods.

[Test conditions]

1. Outdoor environment with natural ventilation
   - Rainy season; Weather: Cloudy → rain, Humidity 72% → 90%
   - Well-Ventilated Area
   - Normal Room temperature



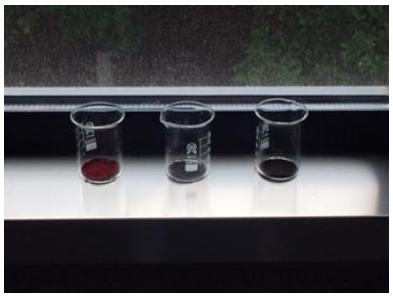
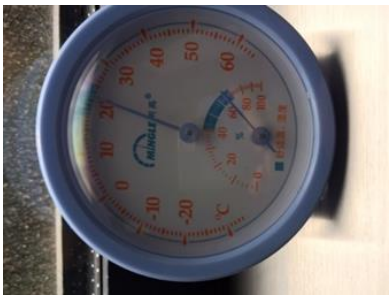
			Start, 0 h	3 hours	6 hours	24 hours
Cationic dye	KAC Red GL-ED	Moisture %	5.3	10.0	12.3	24.2
		OD%	Ref. 100	94.9	92.6	80.1
Disperse dye	KYC Blue E-TB(N)	Moisture %	8.4	10.6	12.4	23.4
		OD%	Ref. 100	97.6	95.6	83.6
Reactive dye	KCN Navy CF-COM	Moisture %	4.3	9.1	10.8	21.9
		OD%	Ref. 100	95.0	93.2	81.6

In an environment where moisture is easily absorbed, the dyes will absorb around 5% of moisture in 3 hours.

NIPPON KAYAKU (THAILAND) CO., LTD.
ADD: 13th Floor, Ramaland Building, 952 Rama IV road, Suriyawongse, Bangrak, Bangkok 10500
TEL: +66-2-235-2843 HP: http://www.kayakuth.co.th

2. Nippon Kayaku China Laboratory (Dyes exposed directly to air)

- Rainy season; Humidity 58%-66%
- Air-conditioned, 22 ℃

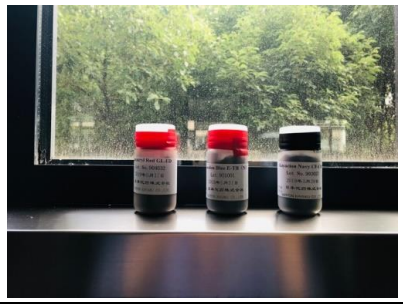
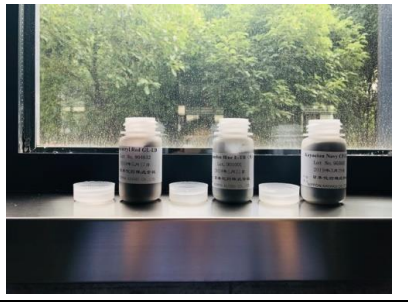




			Start, 0 h	3 hours	6 hours	24 hours
Cationic dye	KAC Red GL-ED	Moisture %	5.3	10.0	10.9	14.1
		OD%	Ref. 100	94.9	94.3	85.9
Disperse dye	KYC Blue E-TB(N)	Moisture %	8.4	9.3	10.3	17.6
		OD%	Ref. 100	99.0	98.1	90.3
Reactive dye	KCN Navy CF-COM	Moisture %	4.3	9.1	11.0	16.8
		OD%	Ref. 100	94.9	93.0	86.5

Even with air conditioning, some of the dyes absorb around 5% of moisture in 3 hours.

3. Nippon Kayaku China Laboratory (Dyes in open plastic container)

- Rainy season; Humidity 58%-66%
- Air-conditioned, 22 ℃

			Start, 0 h	1 day	3 days	7 days
Cationic dye	KAC Red GL-ED	Moisture %	5.3	7.2	7.9	9.3
		Conc. %	Ref. 100	98.0	97.2	95.8
Disperse dye	KYC Blue E-TB(N)	Moisture %	8.4	9.1	9.4	10.5
		Conc. %	Ref. 100	99.2	99.0	97.7
Reactive dye	KCN Navy CF-COM	Moisture %	4.3	5.8	6.2	8.4
		Conc. %	Ref. 100	98.5	98.0	95.7

NIPPON KAYAKU (THAILAND) CO., LTD.
ADD: 13th Floor, Ramaland Building, 952 Rama IV road, Suriyawongse, Bangrak, Bangkok 10500
TEL: +66-2-235-2843 HP: http://www.kayakuth.co.th

Moisture content measurements were taken from 2 g of the upper layer with the lid of container open. It is speculated that some of the moisture has seeped to the middle and bottom.

The tests were conducted under harsher conditions than general factory and production environment. However, it can be recommended that the problem due to moisture can be reduced with care during handling. Closing the lid or fastening the bag and minimizing exposure to air is recommended.
It can be inferred that the higher dye concentration of the newly opened box relative to the previously opened and used dye despite having the same lot no. were caused by the increase in moisture content of the stored dyes, causing the dyeing concentration to decrease.

NIPPON KAYAKU (THAILAND) CO., LTD.
ADD: 13th Floor, Ramaland Building, 952 Rama IV road, Suriyawongse, Bangrak, Bangkok 10500
TEL: +66-2-235-2843 HP: http://www.kayakuth.co.th