

KURARAY POVAL™ Low Ash (LA)

Dear Valued Customers,

“Sodium acetate” is a byproduct produced during PVOH production and almost all polyvinyl alcohol (PVOH) in the market contain a residual level. The sodium acetate content is measured and specified as “ash (Na₂O) content” in our product specification.

Sodium acetate is generally recognized as safe (GRAS). However it is a source of “acetic acid (vinegar smell) generation” during heating. It is also known as a catalyst to accelerate thermal decomposition of PVOH. This technical newsletter explains the effect of sodium acetate on acetic acid generation and the thermal stability (yellowing of products).

1. Tested samples

KURARAY POVAL™ 22-88 has been used as a base sample with different sodium acetate content prepared by washing the base sample.

Grade	Sodium acetate content (wt %)	Ash content (wt%)	
KURARAY POVAL™ 22-88	0.52	0.20	Commercial product
	0.24	0.09	Prepared in Kuraray laboratory for this test
	0.13	0.05	

2. Tested items

2-1. Generation of acetic acid during heating at 150 °C for 10 min.

- Analytical methods; Thermal desorption GC/MS
- Thermal Desorption System
TurboMatrix300 (PerkinElmer)
Tube oven temperature; 150 °C
Desorbtion time; 10min

2-2. Yellow Index measurement

- To heat each sample at 150 °C for 1 and 2 hours
- After the heating 4% aqueous solutions are prepared and yellow index is measured.

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3. Test result

Ash content (wt%)	Acetic acid generation (ppm)	Yellow Index of 4% aqueous solution after heating at 150 °C		
		150°C x 10min.	Before heating	1 hour
0.20	1175	0.9	11.0	20.4
0.09	685		8.9	19.2
0.05	490		4.8	12.0

A dramatic reduction of acetic acid generation and yellowing is observed when the ash content is reduced to 0.05 wt%.

Kuraray possess special technology to reduce the sodium acetate content and such products are offered as “low ash (LA)” grades. Please contact our technical specialist or your local KURARAY POVAL™ representative if you are interested in our LA grades.

Table - Commerical low ash products

Grade name	Viscosity ¹⁾ [mPa•s]	Degree of hydrolysis [mol%]	Non-volatile content [%]	Ash ²⁾ content [%]	pH
KURARAY POVAL 5-74 LA	4.6-5.4	72.5-74.5	97.5 ±2.5	≤0.10	5.0-7.0
4-88 LA	3.4-4.5	86.7-88.7	97.5 ±2.5	≤0.09	4.5-7.0
8-88 LA	7.0-9.0	86.7-88.7	97.5 ±2.5	≤0.09	4.5-7.0
4-98 LA	4.0-5.0	98.0-98.8	97.5 ±2.5	≤0.09	4.5-7.0
20-98 LA	18.5-21.5	98.0-98.8	97.5 ±2.5	≤0.09	4.5-7.0
56-98 LA	52.0-60.0	98.0-98.8	97.5 ±2.5	≤0.09	4.5-7.0
28-99 LA	26.0-30.0	99.0-99.8	97.5 ±2.5	≤0.09	4.5-7.0

1) of a 4 % aqueous solution at 20 °C DIN 53015 / JIS K 6726

2) calculated as Na₂O