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Application Note

/// Dispersing of pure PAN nanofiber membranes

PRODUCT

T 25 easy clean digital (Ident. no.: 0025002560)
S 25 N - 18 G - ST (Ident. no.: 0004447300)
S 18 / 25 - ET 50 disposable tube (Ident. no.: 0003452500)
ICC basic eco 8 (Ident. no.: 0008034900)

INDUSTRY

Chemical

OVERVIEW

The requirement was to disperse pure PAN nanofiber membranes to a sufficiently small particle size that can be detected by an electron microscope whilst keeping the temperature below 60 °C during the dispersing process.

SAMPLE MATERIAL

PAN nanofiber membranes

EXPERIMENTAL SETUP / SETTINGS

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Disperser	T 25 easy clean digital
Dispersing element	S 25 N - 18 G - ST
Temperature control system	ICC basic eco 8
Sample container	S 18 / 25 - ET 50 Disposable tube
Speed	25,000 rpm
Dispersing time	5 min
Sample quantity per batch	0.216 g
Solvent per batch	20 ml water

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RESULTS

The T 25 easy clean was successful in dispersing the PAN nanofibre membranes to a sufficiently small particle size. However, in order to detect a sufficiently high concentration that can be viewed under an electron microscope, the sample needs to be ground in multiple batches (5 in this case).

PAN nanofibre membranes sample
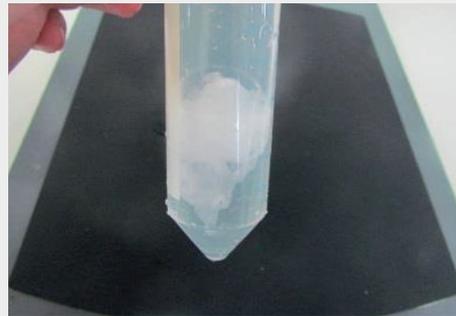
Before dispersing

After dispersing

RECOMMENDATION

Based on the sample requirements, it was determined that the T 25 easy clean control is best suited for this application because of the following features:

1. Integrated temperature sensing tool for real-time sample temperature monitoring to ensure no temperature overshoot. In addition, the sample container should be kept in a water bath during the dispersing process to maintain the temperature below 60 °C.
2. Use of the timer function to set the operating time for unattended operation.

Further recommendation:

Although the sample volume to be dispersed is relatively low, the diameter of the shaft head has to be sufficiently wide to disperse the nanofibre membranes efficiently. If the diameter of the tool head is too small, there will be difficulties in dispersing this type of sample, resulting in an unsatisfactory result.

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