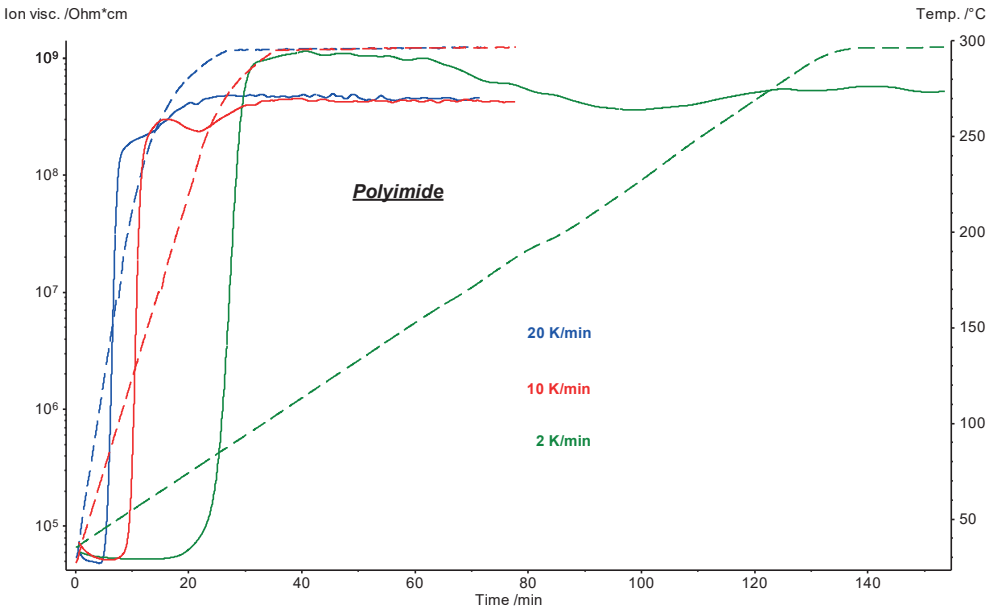
APPLICATION**SHEET**

Polymers · Automotive
DEA 230 E *Artemis*

Polyimide Resin

Introduction

Polyimides are high-performance plastics. They are normally thermoplastics, but they can also be cured. Due to their very good mechanical, chemical and thermal resistance, they are used in sophisticated applications where they can replace metals or glass. They are, for example, interesting for the automobile industry because they withstand intense heat and are resistant against corrosive lubricants and petrol. For applications where polyimides have to be cured, it is important to know the temperature and time the curing process requires.



Test Conditions

Temperature range:	30 ... 300°C, isotherm
Heating/cooling rates:	2, 10 and 20 K/min
Atmosphere:	Air (static)
Sensor:	IDEX (comb structure and electrode distance of 115 µm)
Frequency:	10 kHz

NGB · Application Sheet 143 · E · 1021 · Technical specifications are subject to change.

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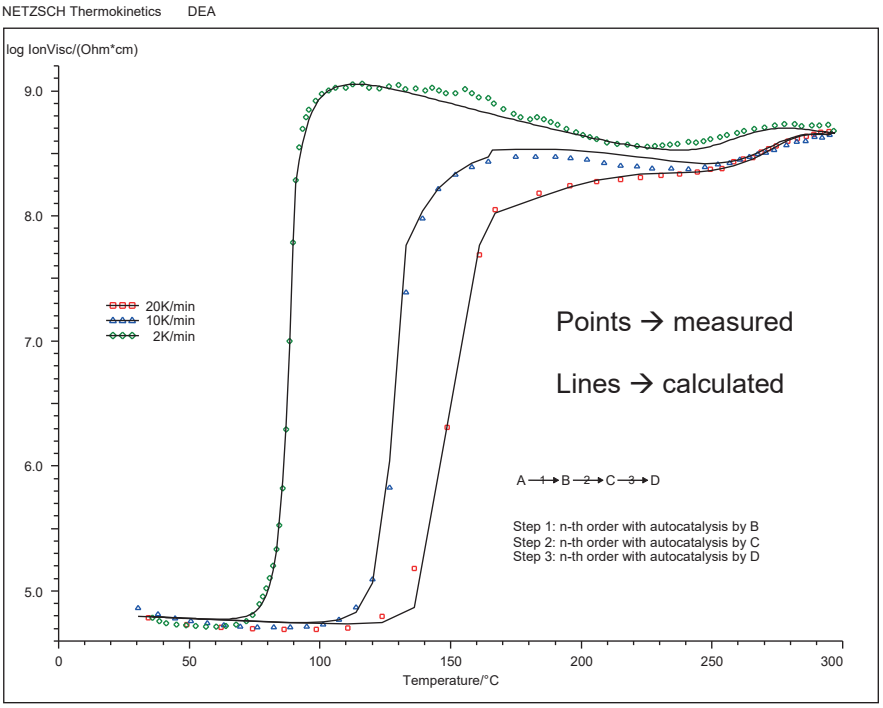
Test Results

At the beginning of the test, the ionic viscosity decreased. This effect is due to softening of the sample because of the temperature increase. Then, the ion viscosity increased – this corresponds to the beginning of curing. After a slight decrease, the ion viscosity increased again; this indicates a second step in the reaction. The ion viscosity increase between the beginning and end of curing amounts to four decades.

On the basis of these three measurements, a kinetic model was calculated with the Thermokinetics software. A model with three successive steps was used: A → B → C → D with all steps autocatalysed. The model fits with the measurements with a correlation coefficient of 0.999.



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