JEOL MS Data Sheet

MS Tips

Mass Spectrometry Application Group
Mass Spectrometry Business Unit
JEOL Ltd.

No. D031

~ Application Note for DART ~

Analysis of highly polar compound by DART ~ analysis of ionic liquid ~

Introduction

Direct analysis in real time (DART™) is applicable to a wide variety of samples; from low polar to highly polar compounds.

Ionic liquids have drawn much attention from various engineering fields, such as tribology, because of their unique properties of electrical conductivity, extremely low vapor pressure, low viscosity, low combustibility, etc. The sample was analyzed by dipping a glass rod to the sample and presented it directly to the DART™ ion source.

Methods

Sample	1-ethyl-3-methylimidazolium-bis(trifluoromethylsulfonyl)imide (EMI-TFSI)
Mass spectrometer	JMS-T100TD time-of-flight mass spectrometer
Ionization	DART (+), DART (-)
Helium gas temperature	200 °C

Results and discussion

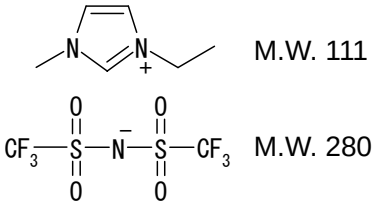

Fig. 1 Structural formulae of EMI-TFSI

As shown in Fig. 2, base peaks were observed at *m/z* 111 and *m/z* 280 for DART(+) and DART(-) respectively. The elemental compositions of the cation and anion were confirmed by accurate mass measurements as shown in Table 1.

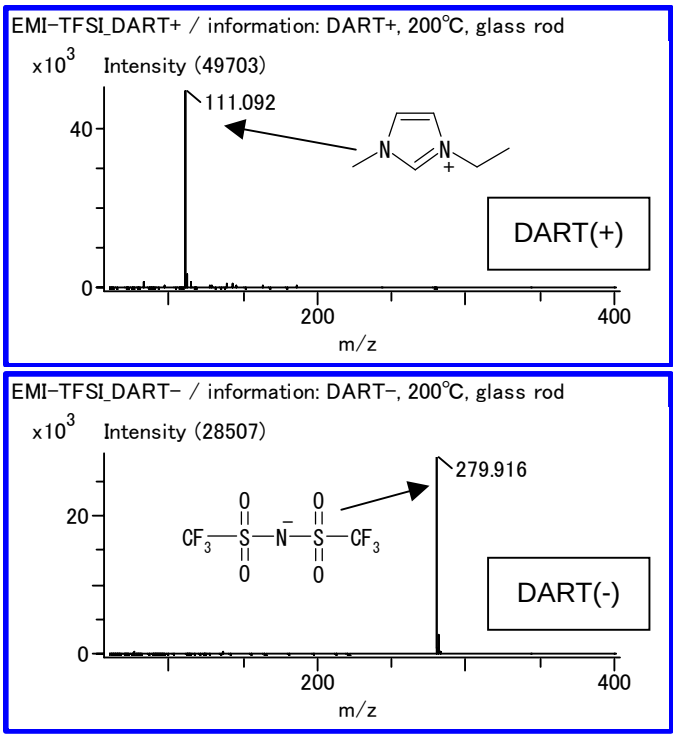

Fig. 2 DART mass spectra (top: DART(+) bottom: DART(-)

	Measured	Theoretical	Error (10^{-3}u)	Elucidated formula	Unsaturation
Cation	111.09226	111.09222	0.04	$C_6H_{11}N_2$	2.5
Anaion	279.91569	279.91729	-1.60	$C_2F_6NO_4S_2$	2.5