Supporting Information (S-1)

Dopant-assisted Negative Photoionization Ion Mobility Spectrometry for Sensitive Detection of Explosives

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ABSTRACT

This supporting information provides additional information on the following aspects:

The schematic diagram for ^{63}Ni source interfaced to atmospheric pressure TOF mass spectrometer (Figure S-1a) and that DANP source interfaced to mass spectrometer (Figure S-1b); Ion mobility spectra of TNT in DANP ion mobility spectrometer and ^{63}Ni negative ion mobility spectrometer (Figure S-2a) and corresponding mass spectra (Figure 2b).

1. In mass spectrometry experiments, part of IMS including the ionization source and reaction region was connected directly to our homemade TOF mass spectrometry to identify the reactant ions as well as explosive product ions formed in them. Figure S-1a and Figure S-1b show the schematic diagram for ^{63}Ni source mass spectrometry and that for dopant-assisted negative photoionization mass spectrometry, respectively. 500 ml/min purified air was introduced from the entrance of ionization region as carrier gas and there is no drift gas. And about 230 ml/min gas was sampled into the lower pressure chamber of mass spectrometer through the capillary inlet and other gas was flushed out of the exhaust. For UVRI source, we removed the dopant reagent in carrier gas for DANP source and placed stainless steel grid before VUV lamp.

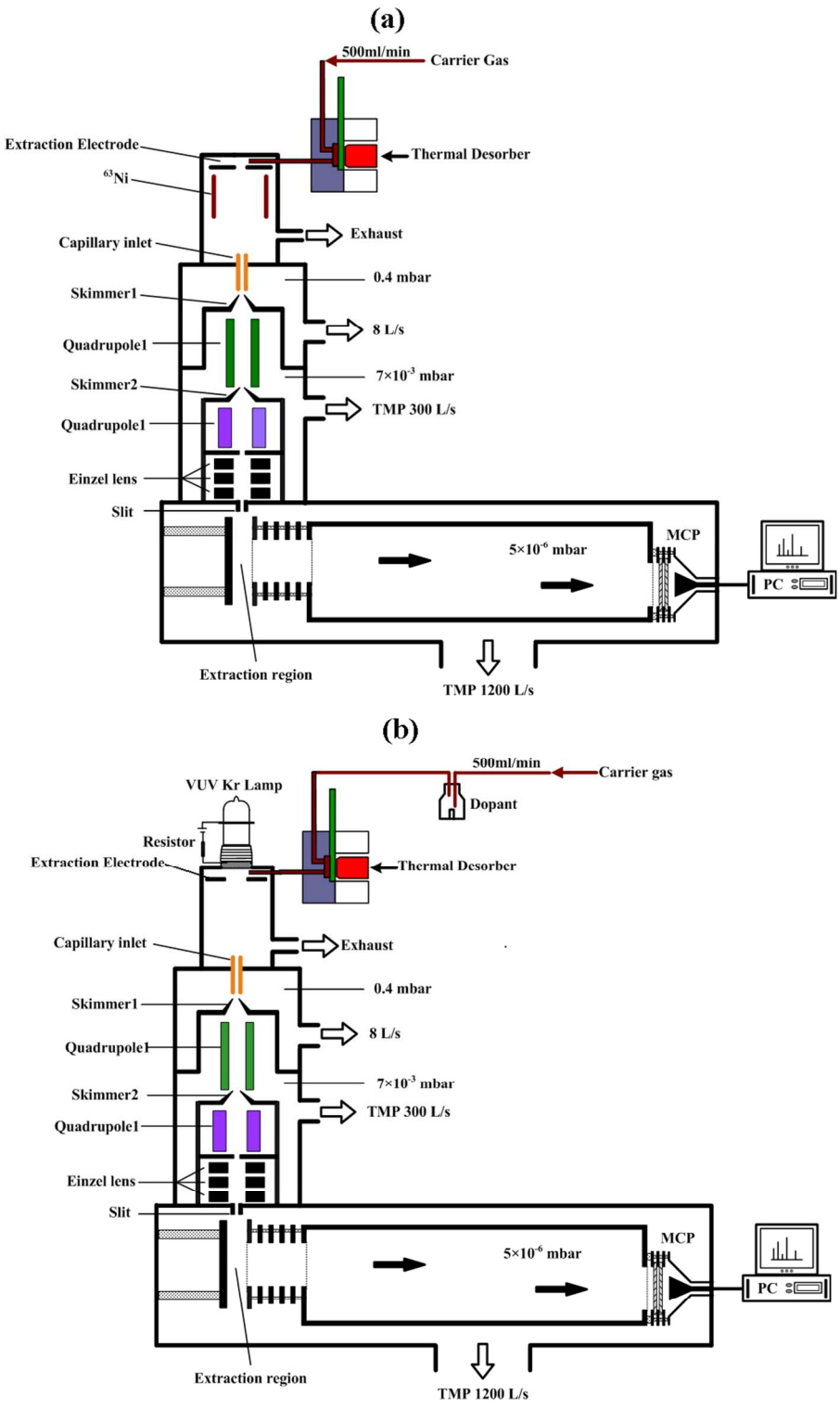

Figure S-1. Schematic diagram of MS instrument with different ionization source (a) ^{63}Ni source, (b) Dopant-assisted negative photoionization source.

2. Ion mobility spectra of TNT for dopant-assisted negative photoionization ion mobility spectrometry and ^{63}Ni negative ion mobility spectrometry and corresponding mass spectra.

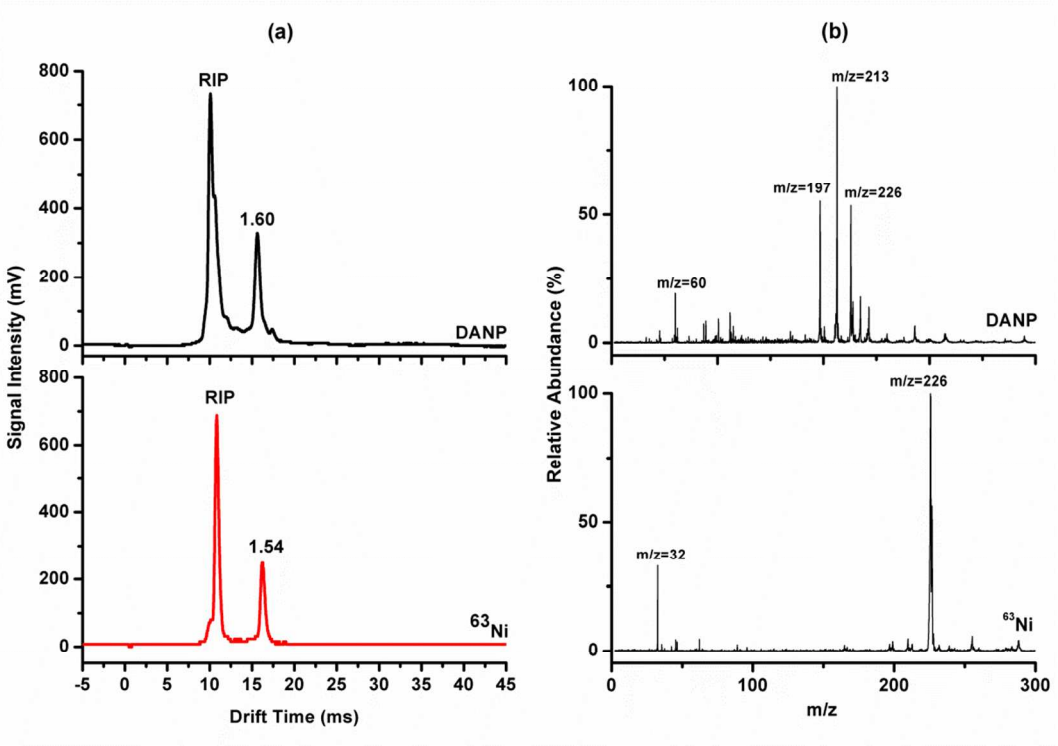

Figure S-2. (a) Ion mobility spectra of TNT obtained in dopant-assisted negative photoionization ion mobility spectrometry and ^{63}Ni negative ion mobility spectrometry. (b) Mass spectra of product ions for TNT in dopant-assisted negative photoionization and ^{63}Ni source.