

Very low pressure CID experiments

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CID is a very common technique, typically used under 'standard' conditions. Sometimes the collision energy is varied or optimized, but other parameters are rarely modified. We have decreased the collision pressure in a triple quadrupole type instrument, resulting in less collisions, which should have a similar effect than decreasing the collision energy. However, low pressure spectra were dissimilar to low energy spectra, and we have studied this effect in detail.

We have found, that decreasing the collision gas pressure to a ca. 50 times lower value than commonly used, we got into a range, where predominantly single collisions occurred. This allowed us to study ion fragmentation and energetics in detail. We have also got information on the efficiency of kinetic to internal energy conversion. Both simple calculations and detailed modeling indicates, that close to 100% of the center of mass collision energy can be converted into internal energy in a single collision.