CLAIMS

1. A method of performing a routine on a mass spectrometer having a source assembly and at least one quadrupole, comprising:

providing a reference sample having known chemical properties;

generating a test mass spectrum from the reference sample using the mass spectrometer;

comparing predetermined characteristics of the test mass spectrum to predetermined performance criteria;

performing an autotune procedure on the mass spectrometer if a first characteristic of the test mass spectrum is deemed not to meet corresponding predetermined performance criteria;,

wherein the first characteristic includes at least one of: the relative intensity of at least one peak of the test mass spectrum; and the shape of at least one peak of the test mass spectrum; and

wherein the autotune procedure comprises adjusting the voltages applied to at least one of the components of a source assembly of the mass spectrometer; and

performing a resolution adjustment and calibration procedure on the mass spectrometer if a second characteristic of the test mass spectrum is deemed not to meet corresponding predetermined performance criteria,

wherein the second characteristic includes at least one of: the width of at least one peak of the test mass spectrum; and the position of at least one peak of the test mass spectrum; and

wherein the resolution adjustment procedure includes adjusting the voltages applied to at least one quadrupole of the mass spectrometer and the calibration procedure includes adjusting the voltages applied to at least one quadrupole of the mass spectrometer.

~~2. A method according to claim 1, wherein the first characteristic includes at least one of: the relative intensity of at least one peak of the test mass spectrum; and the shape of at least one peak of the test mass spectrum.~~

~~3~~2. A method according to claim ~~2~~ 1, wherein the first characteristic includes the relative intensity of each the peaks of the test mass spectrum.

~~4~~3. A method according to claim ~~2~~ 1 or ~~3~~ 2, wherein the first characteristic includes the shape of each of the peaks of the test mass spectrum.

~~5. A method according to any preceding claim, wherein the second characteristic includes at least one of: the width of at least one peak of the test mass spectrum; and the position of at least one peak of the test mass spectrum.~~

~~6~~4. A method according to claim ~~5~~ 1, wherein the second characteristic includes the width of each of the peaks of the test mass spectrum.

~~7~~5. A method according to claim ~~5~~ 1 or ~~6~~ 4, wherein the second characteristic includes the position of each of the peaks of the test mass spectrum.

~~8. A method according to any preceding claim, wherein the autotune procedure comprises adjusting the voltages applied to at least one of the components of a source assembly of the mass spectrometer.~~

~~9. A method according to any preceding claim, wherein the resolution adjustment procedure includes adjusting the voltages applied to at least one quadrupole of the mass spectrometer.~~

~~10. A method according to any preceding claim, wherein the calibration procedure includes adjusting the voltages applied to at least one quadrupole of the mass spectrometer.~~

~~11~~6. A method according to any preceding claim, further comprising:

generating a confirmation mass spectrum from the reference sample following ~~an~~ the autotune and/or resolution adjustment and calibration procedure; and

comparing predetermined characteristics of the confirmation mass spectrum to the predetermined performance criteria.

~~12~~7. A method according to any preceding claim, wherein a predetermined performance criterion of the predetermined performance criteria is that a characteristic of the test mass spectrum is within a predetermined range of the corresponding characteristic of a stored mass spectrum for the reference sample.

~~13~~8. A method according to any preceding claim, wherein the reference sample is Perfluorotributylamine (PFTBA).

~~14~~9. A method according to any preceding claim, further comprising detecting a leak in the mass spectrometer and providing an indication of the detected leak to an operator.

~~15~~10. A method according to claim ~~14~~ 9, wherein the step of detecting a leak comprises:

generating a background mass spectrum of the mass spectrometer background;

detecting the presence of at least one of water and air;

providing an indication of a detected leak to an operator if the amount of water and/or air is higher than a predetermined level.

~~16~~11. A method according to claim ~~15~~ 10, comprising providing an indication of a detected leak to an operator if the ratio of water to nitrogen, nitrogen to argon and/or oxygen to argon is higher than a predetermined level.

~~17~~12. A method according to any preceding claim, further comprising:

generating a report of the predetermined characteristics measured and indicating whether the corresponding predetermined performance criteria were met.

~~18~~13. A mass spectrometer, comprising:

an inlet to receive a reference sample having known chemical properties;

an ion source configured to receive the reference sample and ionize it, the ion source including at least one source assembly;

at least one quadrupole;

a detector to generate a test mass spectrum from the reference sample; and

a controller configured to:

compare predetermined characteristics of the test mass spectrum to predetermined performance criteria;

perform an autotune procedure on the mass spectrometer if a first characteristic of the test mass spectrum is deemed not to meet corresponding predetermined performance criteria~~;~~,

wherein the first characteristic includes at least one of: the relative intensity of at least one peak of the test mass spectrum; and the shape of at least one peak of the test mass spectrum; and

wherein the autotune procedure comprises adjusting the voltages applied to at least one of the components of the source assembly of the mass spectrometer; and

perform a resolution adjustment and calibration procedure on the mass spectrometer if a second characteristic of the test mass spectrum is deemed not to meet corresponding predetermined performance criteria,

wherein the second characteristic includes at least one of: the width of at least one peak of the test mass spectrum; and the position of at least one peak of the test mass spectrum; and

wherein the resolution adjustment procedure includes adjusting the voltages applied to the at least one quadrupole of the mass spectrometer and the calibration procedure includes adjusting the voltages applied to the at least one quadrupole of the mass spectrometer.