

What is claimed is:

1. A method of minimising false peaks in a mass spectrometer having an ion detector, comprising the steps of:
 measuring a plurality of baseline electronic signals characteristic of the mass spectrometer;
 setting a Baseline threshold value equal to:

$$\text{Baseline threshold value} = \text{baseline}_{\text{average}} + (\text{baseline}_{\text{max}} - \text{baseline}_{\text{min}})$$
 where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals,
 $\text{baseline}_{\text{max}}$ is the maximum baseline electronic signal measured and $\text{baseline}_{\text{min}}$ is the minimum baseline electronic signal measured;
 receiving one or more ion signals at the ion detector;
 comparing the ion input signal to the Baseline threshold value; and
 multiplying the ion input signal by a selected compensation factor when the ion input signal exceeds the Baseline threshold value.
2. The method of claim 1 wherein the selected compensation factor is determined based on the intensity of at least one of the received ion signals.
3. The method of claims 1 or 2, further comprising: adjusting the selected compensation factor by adjusting a control voltage applied to the ion detector in response to the intensity of the one or more ion input signals.
4. The method of any one of claims 1 to 3, further comprising establishing or extracting a multiplier voltage and determining the selected compensation factor from a look-up table or calibration curve having compensation factor verses multiplier voltage values.
5. A method of controlling an ion detector, comprising the steps of:
 determining an electronic baseline signal of the ion detector;
 receiving one or more ion input signals at the ion detector;
 comparing the ion input signal to the electronic baseline signal; and
 multiplying the ion input signal by a selected compensation factor when the ion input signal exceeds the electronic baseline signal.

6. The method of claim 5 wherein the selected compensation factor is determined based on the intensity of at least one of the received ion signals.
7. The method of claims 5 or 6, further comprising: adjusting the selected compensation factor by adjusting a control voltage applied to the ion detector in response to the intensity of the one or more ion input signals.
8. The method of any one of claims 5 to 7, further comprising establishing or extracting a multiplier voltage and determining the selected compensation factor from a look-up table or calibration curve having compensation factor verses multiplier voltage values.
9. A method of increasing dynamic range in an ion detector, characterised in that compensation factor applied to the ion detector is adjusted based on the intensity of received ion signals without adjusting a baseline electronic signal of the ion detector.
10. A computer readable medium including software for controlling an ion detector of a mass spectrometer, the computer readable memory comprising logic configured for implementing the steps of:
initially measuring a plurality of baseline electronic signals characteristic of the mass spectrometer;
setting a Baseline threshold value equal to:

$$\text{Baseline threshold value} = \text{baseline}_{\text{average}} + (\text{baseline}_{\text{max}} - \text{baseline}_{\text{min}})$$
 where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals, $\text{baseline}_{\text{max}}$ is the maximum baseline electronic signal measured and $\text{baseline}_{\text{min}}$ is the minimum baseline electronic signal measured;
receiving one or more ion signals at the ion detector;
comparing the ion input signal to the Baseline threshold value; and
multiplying the ion input signal by a selected compensation factor when the ion input signal exceeds the Baseline threshold value.
11. The computer readable medium of claim 10 further comprising logic configured for implementing the step of: establishing or extracting a multiplier voltage and determining the selected compensation factor from a look-up table or calibration curve having compensation factor verses multiplier voltage values.

What is claimed is:

1. A method of minimizing false peaks in a mass spectrometer having an ion detector that uses extended dynamic range techniques in forming a detector output signal, the method comprising the steps of:

initially measuring a plurality of baseline electronic signals characteristic of the mass spectrometer;

setting a Baseline threshold value equal to one of:

(i) $\text{Baseline threshold value} = \text{baseline}_{\text{average}} + (\text{baseline}_{\text{max}} - \text{baseline}_{\text{min}})$

where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals, $\text{baseline}_{\text{max}}$ is the maximum baseline electronic signal measured and $\text{baseline}_{\text{min}}$ is the minimum baseline electronic signal measured; and

(ii) $\text{Baseline threshold value} = \text{baseline}_{\text{average}} + \text{SD}$

where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals and SD is a standard deviation of the average of the plurality of baseline electronic signals;

receiving one or more ion input signals at the ion detector;

comparing each ion input signal to the Baseline threshold value; and

multiplying each ion input signal by a selected compensation factor when the ion input signal exceeds the Baseline threshold value while excluding those ion input signals which are below the Baseline threshold value from the multiplication, such that the output signal includes ion input signals that have been multiplied by the compensation factor and ion input signals that have not been multiplied by the compensation factor.

2. The method of claim 1 wherein the selected compensation factor is determined based on the intensity of at least one of the received ion signals.

3. The method of claim 1 further comprising: adjusting the selected compensation factor by adjusting a control voltage applied to the ion detector in response to the intensity of the one or more ion input signals.

4. The method of claim 1 further comprising establishing or extracting a multiplier voltage and determining the selected compensation factor from a look-up table or calibration curve having compensation factor verses multiplier voltage values.

5. A non-transitory computer readable medium including software for controlling an ion detector of a mass spectrometer, the computer readable memory comprising logic configured for implementing the steps of:

initially measuring a plurality of baseline electronic signals characteristic of the mass spectrometer;

setting a Baseline threshold value equal to one of:

$$(i) \text{ Baseline threshold value} = \text{baseline}_{\text{average}} + (\text{baseline}_{\text{max}} - \text{baseline}_{\text{min}})$$

where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals, $\text{baseline}_{\text{max}}$ is the maximum baseline electronic signal measured and $\text{baseline}_{\text{min}}$ is the minimum baseline electronic signal measured; and

$$(ii) \text{ Baseline threshold value} = \text{baseline}_{\text{average}} + \text{SD}$$

where $\text{baseline}_{\text{average}}$ is an average of the plurality of baseline electronic signals and SD is a standard deviation of the average of the plurality of baseline electronic signals;

receiving one or more ion signals at the ion detector;

comparing each ion input signal to the Baseline threshold value; and

multiplying each ion input signal by a selected compensation factor when the ion input signal exceeds the Baseline threshold value, while excluding those ion input signals which are below the Baseline threshold value from the multiplication, such that an output signal of the detector includes ion input signals that have been multiplied by the compensation factor and ion input signals that have not been multiplied by the compensation factor.

6. The non-transitory computer readable medium of claim 5 further comprising logic configured for implementing the step of: establishing or extracting a multiplier voltage and determining the selected compensation factor from a look-up table or calibration curve having compensation factor verses multiplier voltage values.

7. The non-transitory computer readable medium of claim 5 wherein the selected compensation factor is determined based on the intensity of at least one of the received ion signals.

8. The non-transitory computer readable medium of claim 5 wherein the steps implemented by the logic of the computer readable memory further comprise adjusting the selected compensation factor by adjusting a control voltage applied to the ion detector in response to the intensity of the one or more ion input signals.

9. The method of claim 5 wherein the steps implemented by the logic of the computer readable memory further comprise establishing or extracting a multiplier voltage and determining the selected compensation factor from a lookup table or calibration curve having compensation factor verses multiplier voltage values.