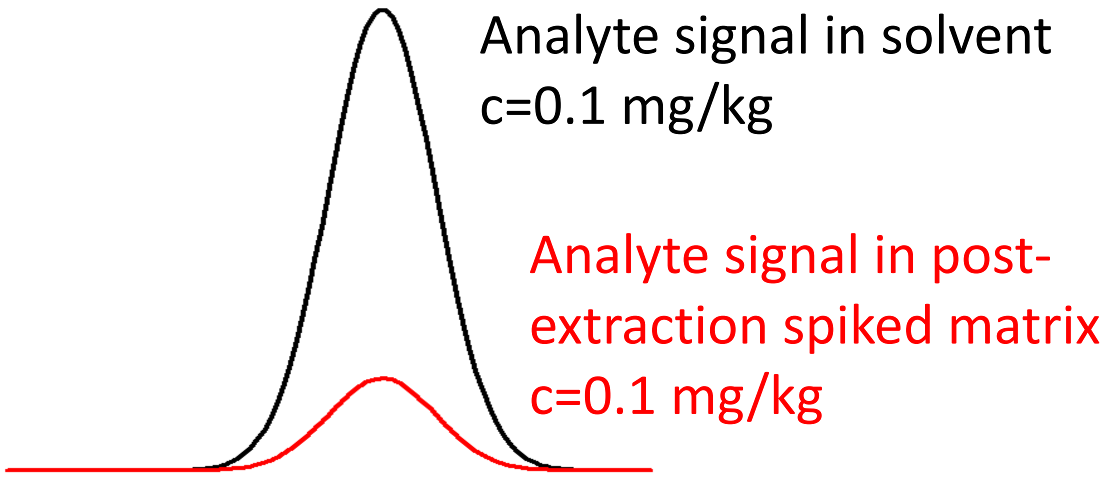
Evaluating matrix effect

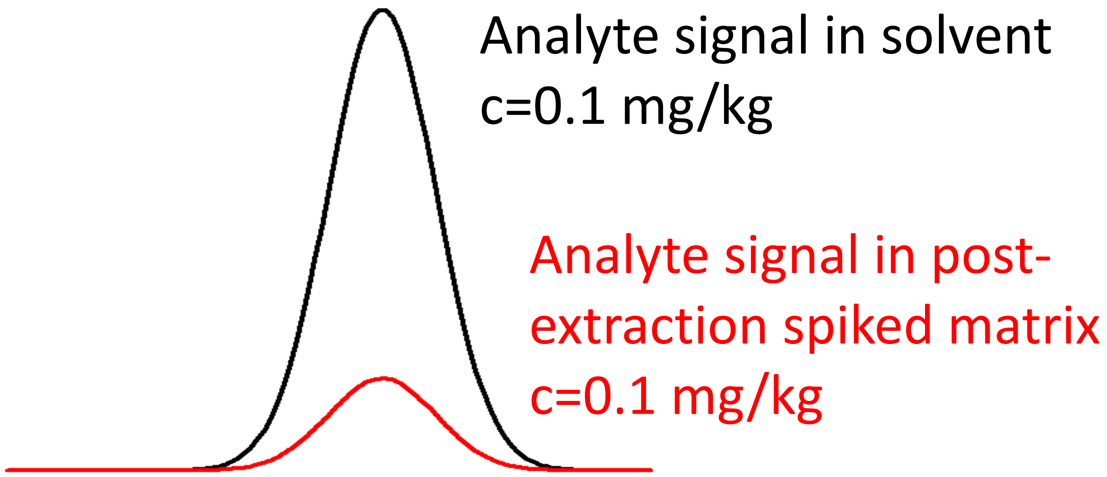
Signal-based method



$$\%ME = \frac{\text{Analyte signal}_{\text{post-extraction spiked matrix}}}{\text{Analyte signal}_{\text{solvent}}} \cdot 100\%$$

100% no matrix effect
<100% ionization suppression
>100% ionization enhancement

Signal-based method



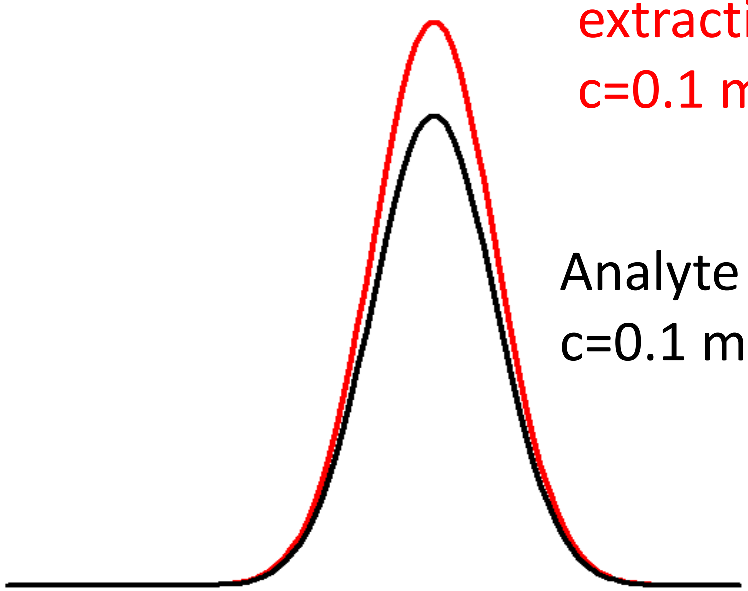
$$\%ME = \frac{\text{Analyte signal}_{\text{post-extraction spiked matrix}}}{\text{Analyte signal}_{\text{solvent}}} \cdot 100\%$$

100% no matrix effect

<100% ionization suppression

>100% ionization enhancement

Signal-based method



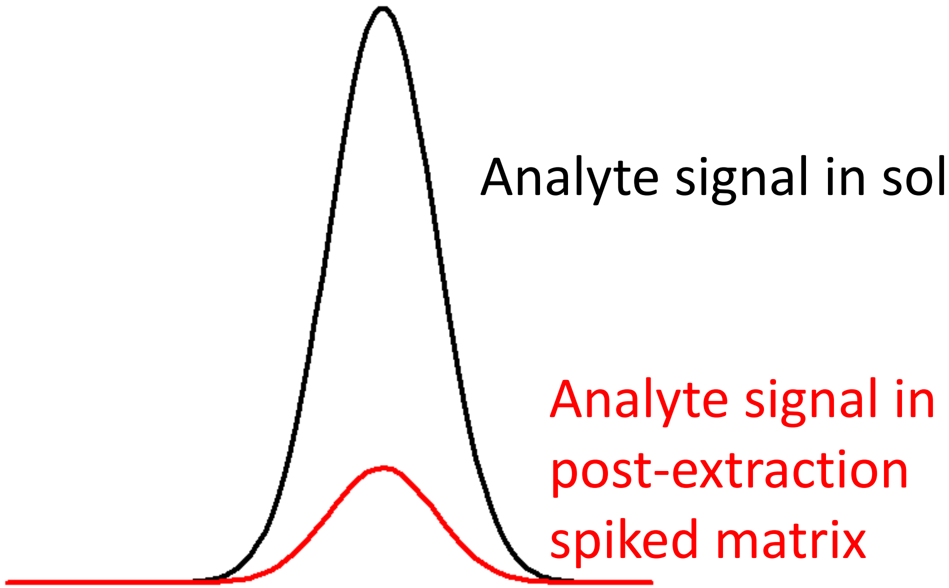
$$\%ME = \frac{\text{Analyte signal}_{\text{post-extraction spiked matrix}}}{\text{Analyte signal}_{\text{solvent}}} \cdot 100\%$$

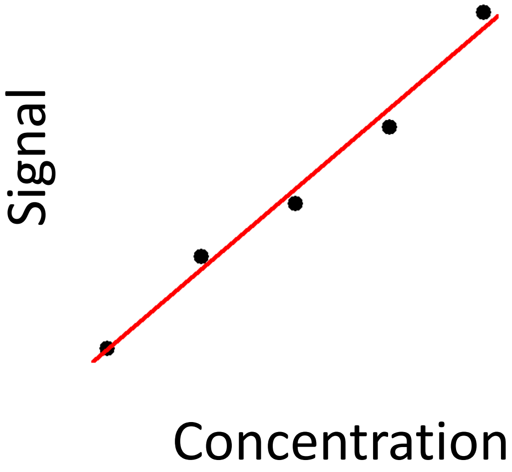
100% no matrix effect

<100% ionization suppression

>100% ionization enhancement

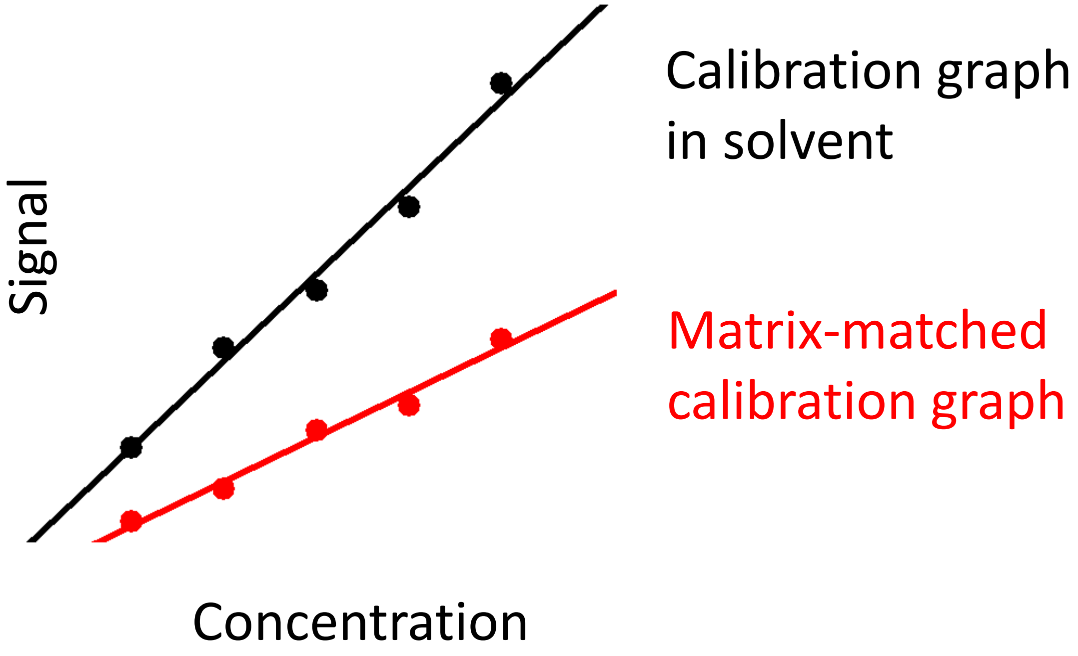
Concentration-based method





$$\%ME = \frac{\text{Analyte concentration found}_{\text{post-extraction spiked matrix}}}{\text{Spiked concentration}_{\text{solvent}}} \cdot 100\%$$

Calibration graph method



$$\%ME = \frac{\text{Slope}_{\text{matrix-matched}}}{\text{Slope}_{\text{solvent}}} \cdot 100\%$$

%ME does not depend on analyte concentration
Suitable for samples already containing analyte

Combining recovery and matrix effect

$$\%PE = \frac{\%R \cdot \%ME}{100\%}$$

Process efficiency:
Common term for expressing trueness in LC-MS

Recovery:
Loss of analyte in sample pre-treatment

Matrix effect:
Matrix influence on analytes ionization