Before you begin –
What is needed to determine LOD and measurement uncertainty?

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What is the LOQ (or LOD)?

What is the measurement uncertainty?

Why is the LOQ (LOD) so high?

Why is the measurement uncertainty so high?

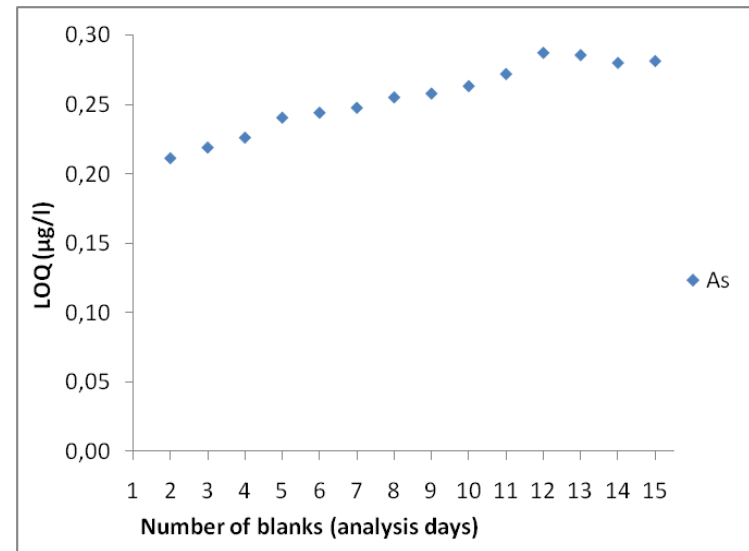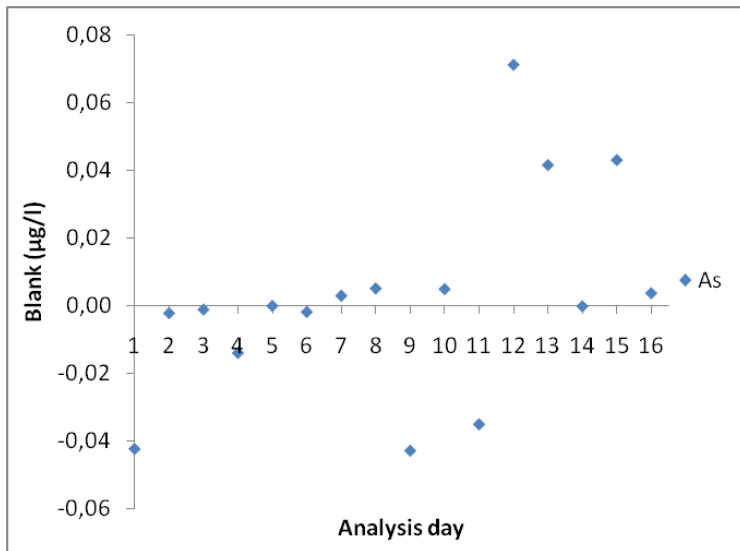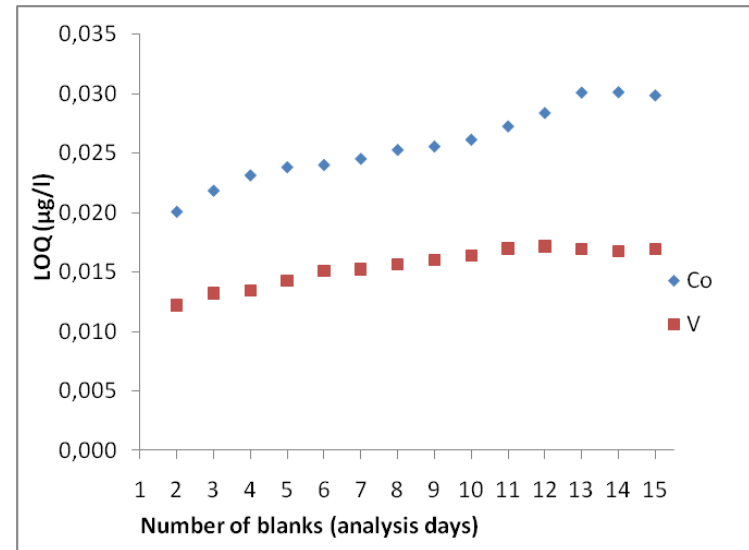# What is the LOQ and LOD?
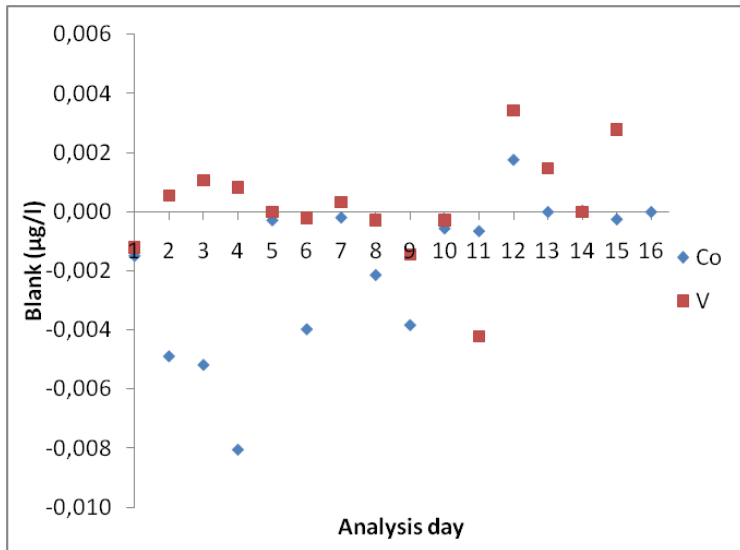
LOD = 3 * stdev of blank results
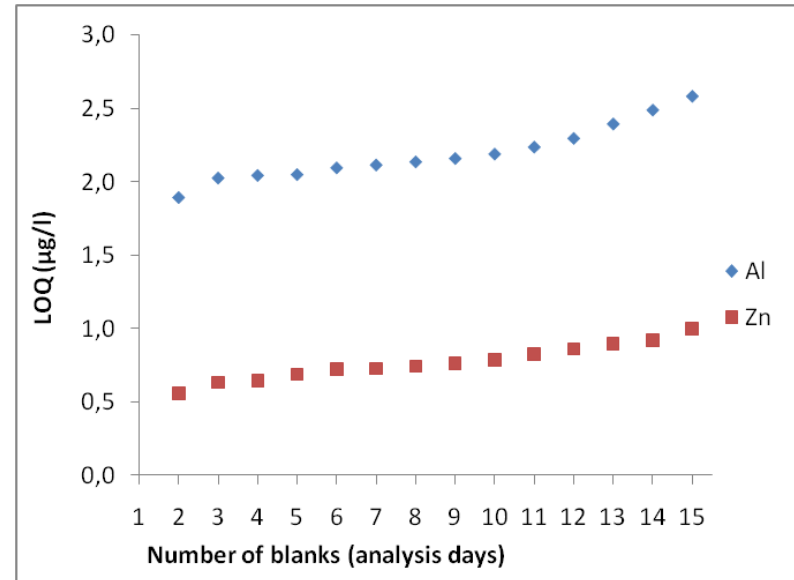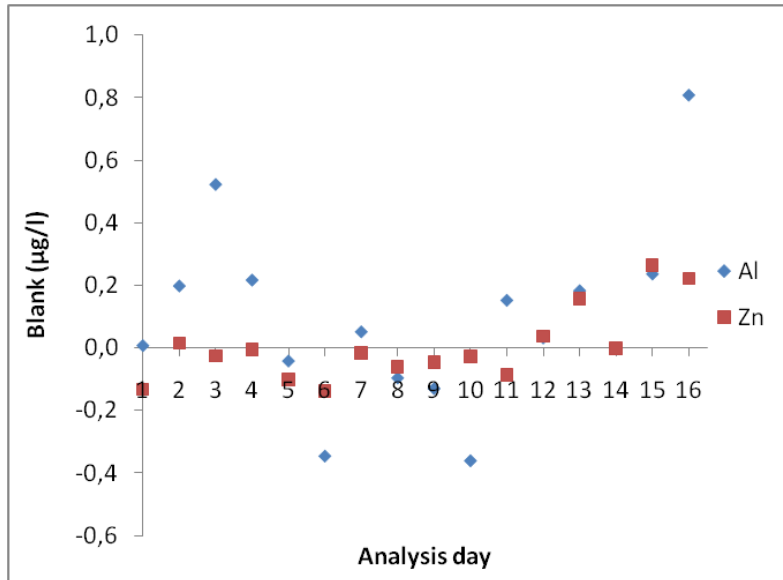
LOQ = 3 * (average + 3*stdev) of blank results

Example

Analysis of metals in surface waters.

Blank samples (1% HNO_3 in MQ water) analysed 16 different days.

Calculation of LOQ from different number of blanks
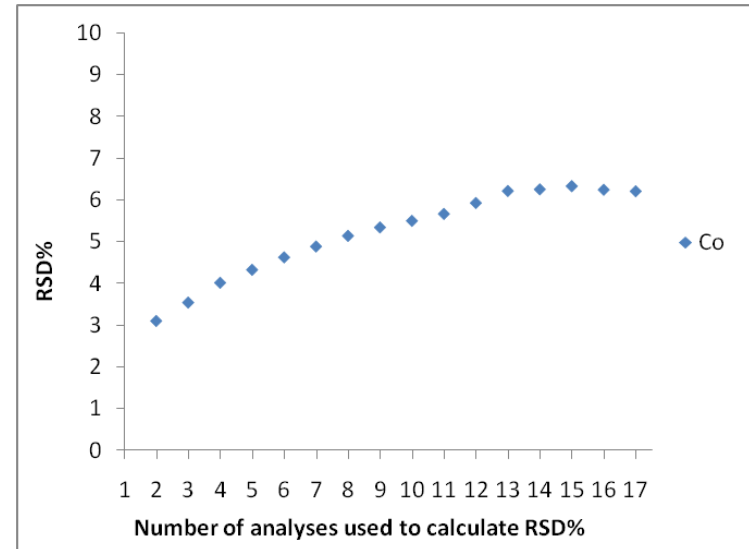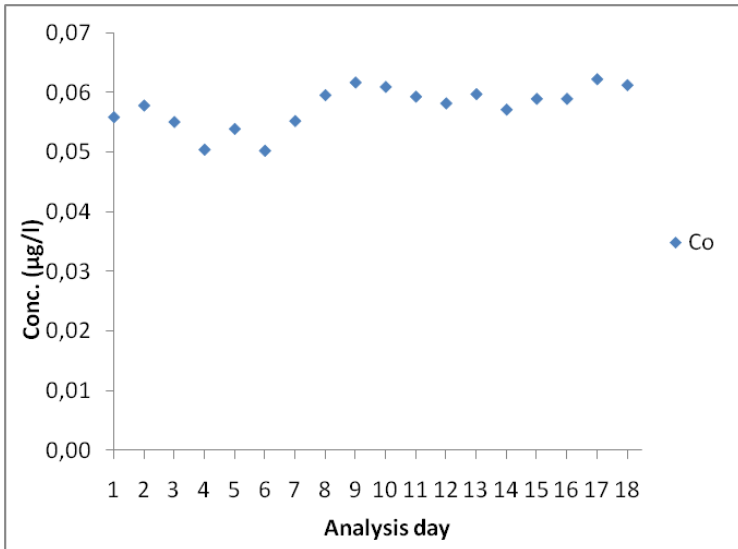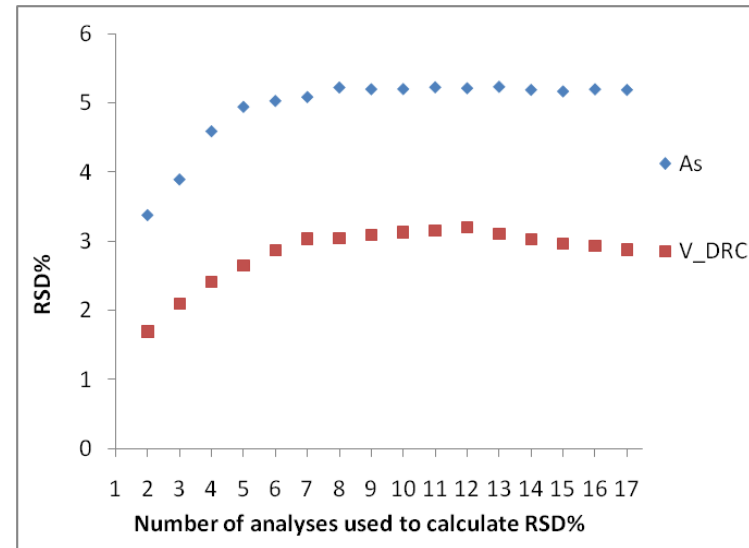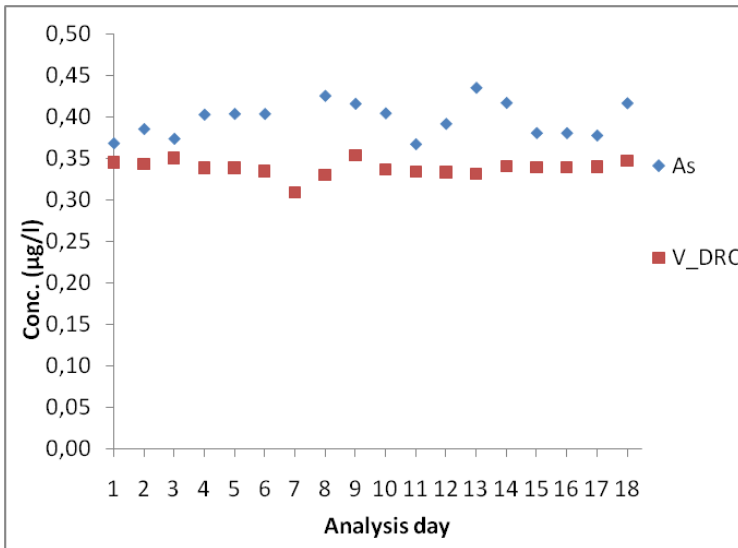
Calculation of LOQ from different number of blanks

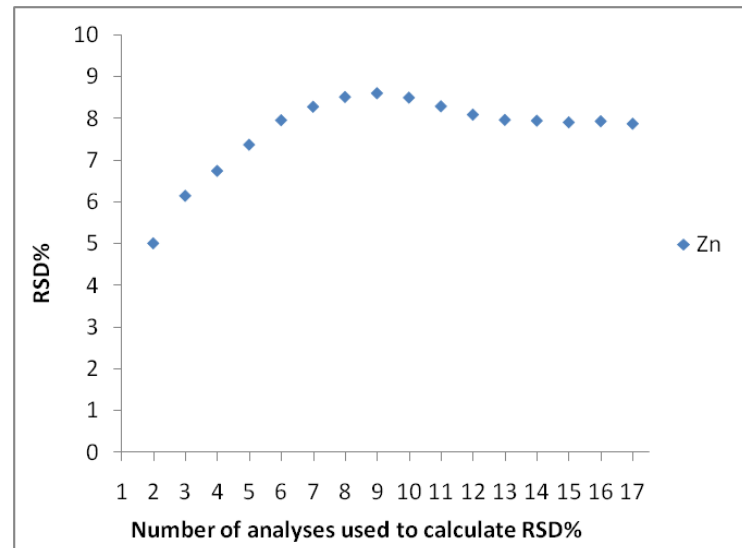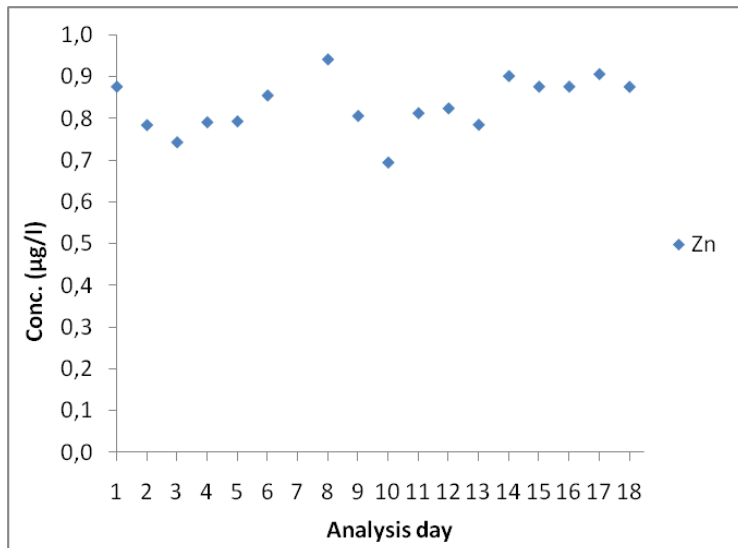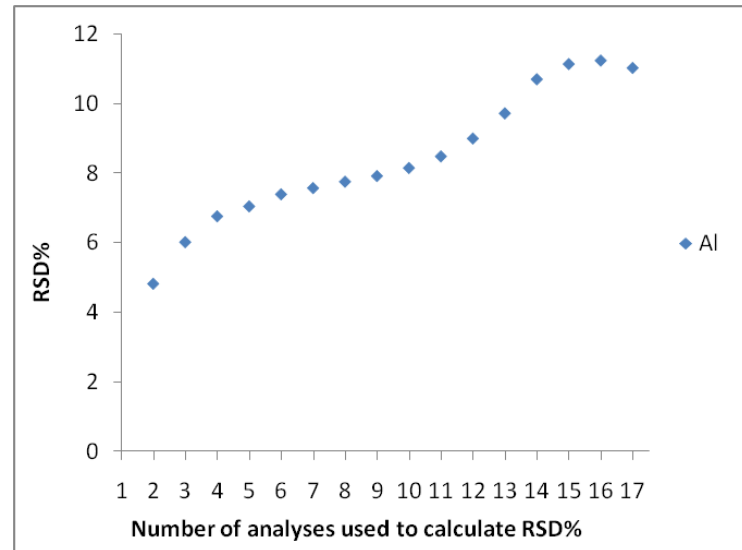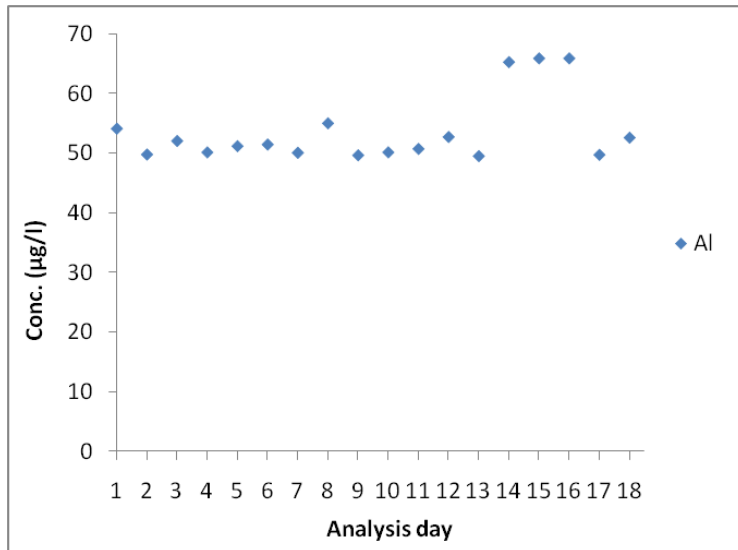# What is the measurement uncertainty?

Example

Analysis of metals (ICP-MS) in SLRS-5, a surface water.

Analysed 18 times during 1.4 years.

What is the measurement uncertainty?

What is the measurement uncertainty?

When there is enough data to estimate LOQ and measurement uncertainty

Why is the LOQ (LOD) so high?

Why is the measurement uncertainty so high?

Why is the LOQ so high?

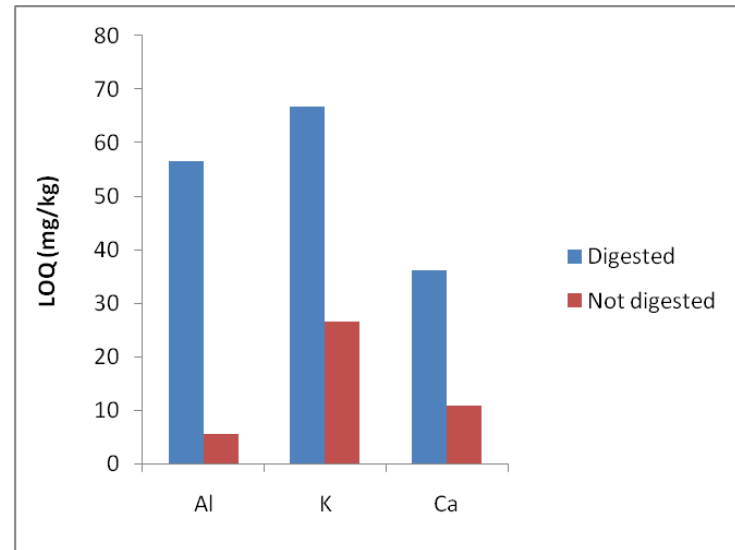## Example

Biogas sludge

Digestion method: 0,25 g sample
20 ml 7 M HNO_3
120 ^{o}C
30 min

Diluted to 500 ml after digestion, before ICP-MS analysis.

Comparison of digested and undigested (1% HNO_3 solution) blanks.

Why is the LOQ so high?

LOQ calculated from digested and not digested blank samples.

Why is the measurement uncertainty so high?

Example
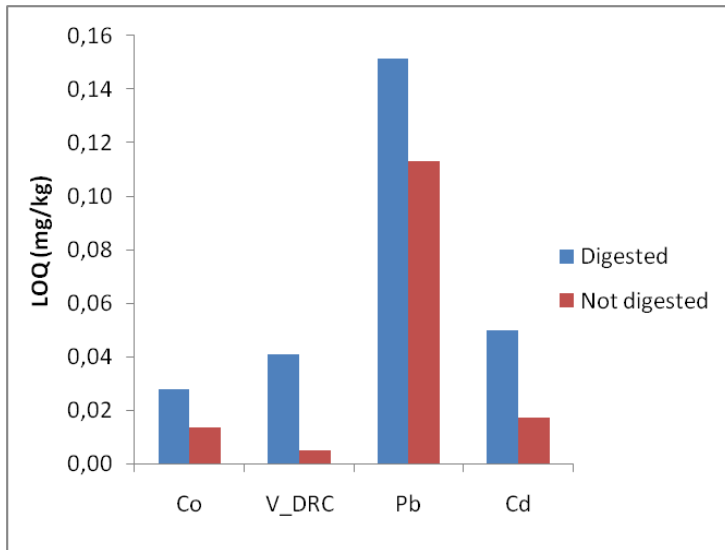
Biogas sludge
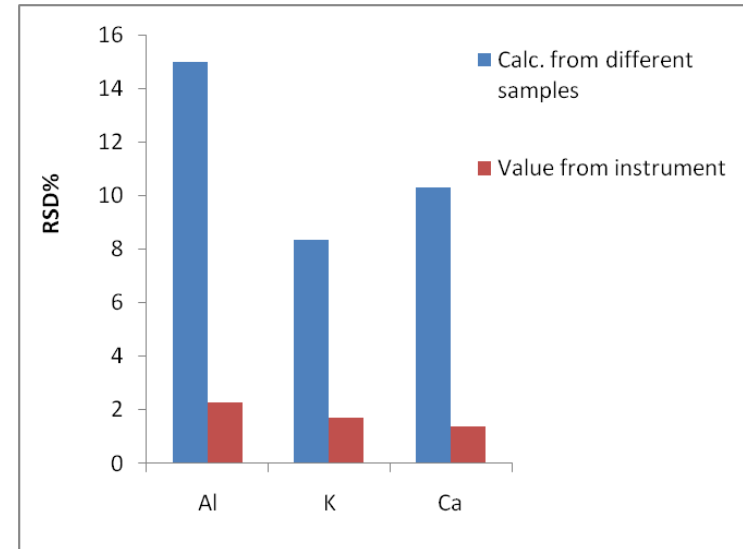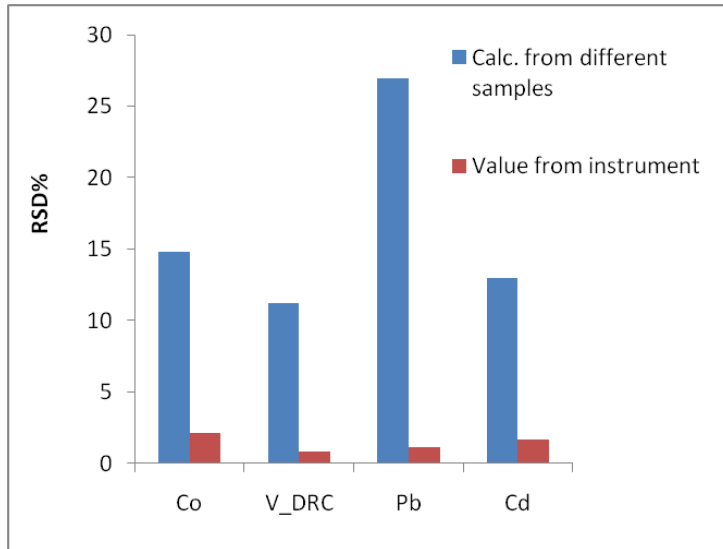
Digestion method: 0,25 g sample
                   20 ml 7 M HNO_3
                   120 ^{o}C
                   30 min

Diluted to 500 ml after digestion, before ICP-MS analysis.

Analysis of a certified sludge, CRM 029-050.

Why is the measurement uncertainty so high?

Calc. from different samples: Sludge (CRM 029-050) digested and analysed at different days.

Value from instrument: the same sample (CRM 029-050) analysed three times by the instrument.