



Jülich, 28. August 2014

ANALYSIS REPORT

Customer : ORAL ICEBERG S.L., Granollers Barcelona, Spain
 Analysis task: Activity measurement of the nuclides ^{232}Th and ^{238}U in dental ceramic.
 Analyst : O. Laugs (Tel. +49 2461 613384)

Sample preparation and measurement:

An amount of about 100g of the ceramic sample was measured with a well-shielded γ -ray spectrometer for 15 hours. Calibration of the detector was carried out with a ^{152}Eu -doped sand standard of the same geometry. By the use of the sand standard the γ -self-absorption within the sample matrix was taken into account.

Results:

Some decay products of the decay chains of ^{232}Th and ^{238}U are γ -emitting nuclides and can be measured by γ -ray spectrometry. Activities of ^{232}Th and ^{238}U were calculated with the assumption of radioactive equilibrium.

Detection limits were calculated according to DIN 25482.

Sample	^{238}U [Bq/g]	^{232}Th [Bq/g]
Y-TZP Materialcharge 18/14	< 0.03	< 0.03

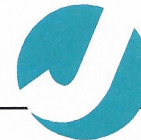
Remarks:

The activity of ^{238}U is far below the allowable threshold of 1 Bq/g according to ISO-Norm 6872. For comparison, the mean activities of ^{238}U and ^{232}Th in the earth's crust are in the range of 0.03 Bq/g.

Sincerely yours

(Dr. S. Maischak)

(O. Laugs)



Jülich, 11. October 2015

ANALYSIS REPORT

Report of the radioactive contamination of the sample Tosoh Zirconia Powder, TZ-3YB-E
Lot No.: Z304597B, charge of the material 21/15

Customer : ORAL ICEBERG S.L., Granollers Barcelona, Spain

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Sample preparation and measurement:

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Results:

Some decay products of the decay chains of ^{232}Th and ^{238}U are γ -emitting nuclides and can be measured by γ -ray spectrometry. Activities of ^{232}Th and ^{238}U were calculated with the assumption of radioactive equilibrium.

Detection limits were calculated according to DIN ISO 11929.

Sample	^{238}U [Bq/g]	^{232}Th [Bq/g]
TZ-3YB-E (Tosoh), Materialcharge 21/15	< 0.03	< 0.03

Remarks:

The activity of ^{238}U is far below the allowable threshold of 1 Bq/g according to ISO-Norm 6872. For comparison, the mean activities of ^{238}U and ^{232}Th in the earth's crust are in the range of 0.03 Bq/g.

Sincerely yours

(Dr. E. Joußen)

(O. Laugs)