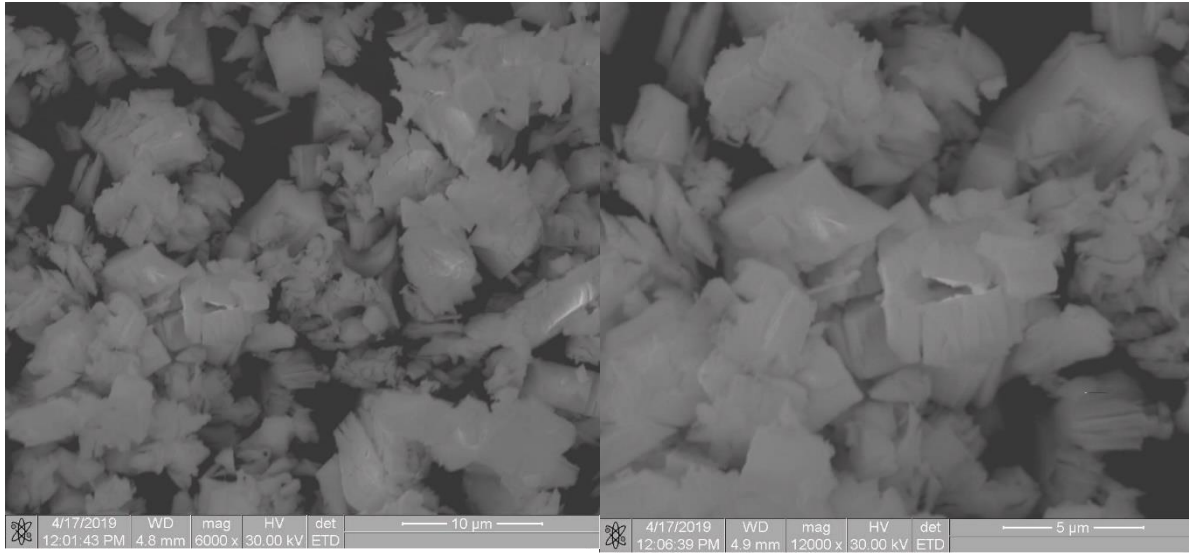


# “Nanopowder” $\text{Gd}_2\text{O}_3$ -304 (99.9 %)

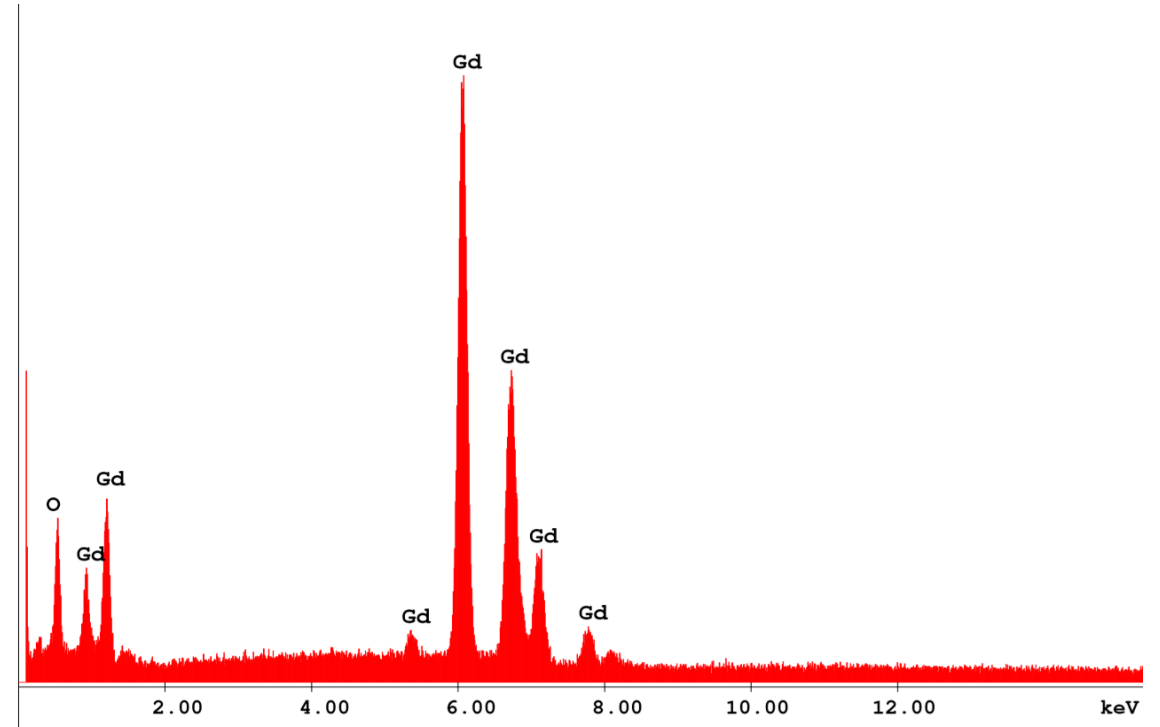


6000x

12000x

Particles with the size 1-10  $\mu\text{m}$

No nanoparticles !



## EDAX ZAF Quantification (Standardless)

Element Normalized  
SEC Table : Default

| Element | Wt %   | At %   | K-Ratio | Z      | A      | F      |
|---------|--------|--------|---------|--------|--------|--------|
| O K     | 10.64  | 53.92  | 0.0304  | 1.2561 | 0.2274 | 1.0000 |
| GdL     | 89.36  | 46.08  | 0.8673  | 0.9537 | 1.0176 | 1.0000 |
| Total   | 100.00 | 100.00 |         |        |        |        |

| Element | Net Inte. | Bkgd Inte. | Inte. Error | P/B   |
|---------|-----------|------------|-------------|-------|
| O K     | 34.35     | 5.23       | 2.52        | 6.56  |
| GdL     | 315.33    | 15.19      | 0.76        | 20.75 |

## Gd –compounds radiopurity according ICP-MS data ( Mendeleev University)

|  | TDM96 (RU) Gd <sub>2</sub> O <sub>3</sub> , | TDM96 (RU) Gd <sub>2</sub> O <sub>3</sub> after 3 <sup>rd</sup> stage of purification | Lankhit (RU) GdCl <sub>3</sub> | Gd <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> (99.9%) | Nanopowder Gd <sub>2</sub> O <sub>3</sub> -304 (99.9 %) | ILIOTEC (20-80nm) | ILIOTEC (100 nm) | IREA (RU) Gd(NO <sub>3</sub> ) <sub>3</sub> | IREA (RU) Gd <sub>2</sub> O <sub>3</sub> |
|--|---|---|--------------------------------|---|---|-------------------|------------------|---|--|
| Th, mBq/kg (Standard deviation, mBq/kg ) | 184 (52)                                    | 12 ( 4 )  | 17.0 ( 0.8)                    | 472(51)   | 132(13)   | 15(3)             | 17438(4709)      | 0,8(0,1)                                    | 4,8(1,1)                                 |
| U, mBq/kg (Standard deviation, mBq/kg )  | 440 ( 43 )                                  | 117 ( 37 )  | 8.3 (0.6)                      | 22(1)   | 2005(93)  | 592(13)           | 23817(989)       | 2,8(0,5)                                    | 16,7(0,8)                                |

NEW DATA

1 Bq <sup>238</sup>U/kg = 81 ppb U

1 Bq <sup>232</sup>Th/kg = 246 ppb Th

# Gd –compounds radiopurity according to the ICP-MS data (Mendeleev University)

