

Synthesis of Oxide Ceramics in Detonating Atmosphere

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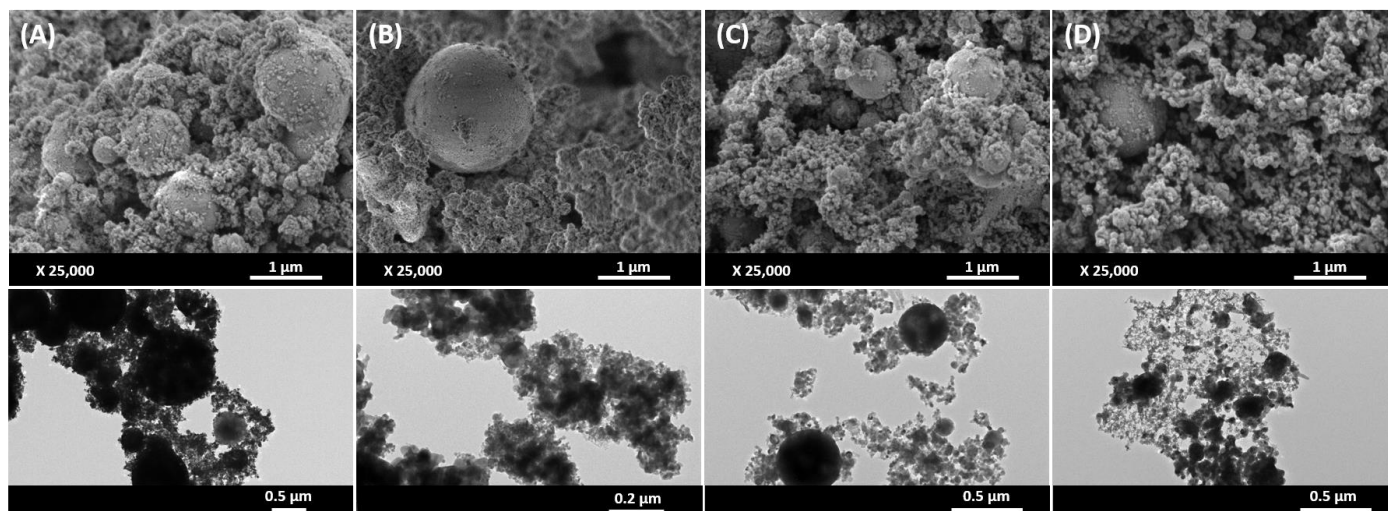
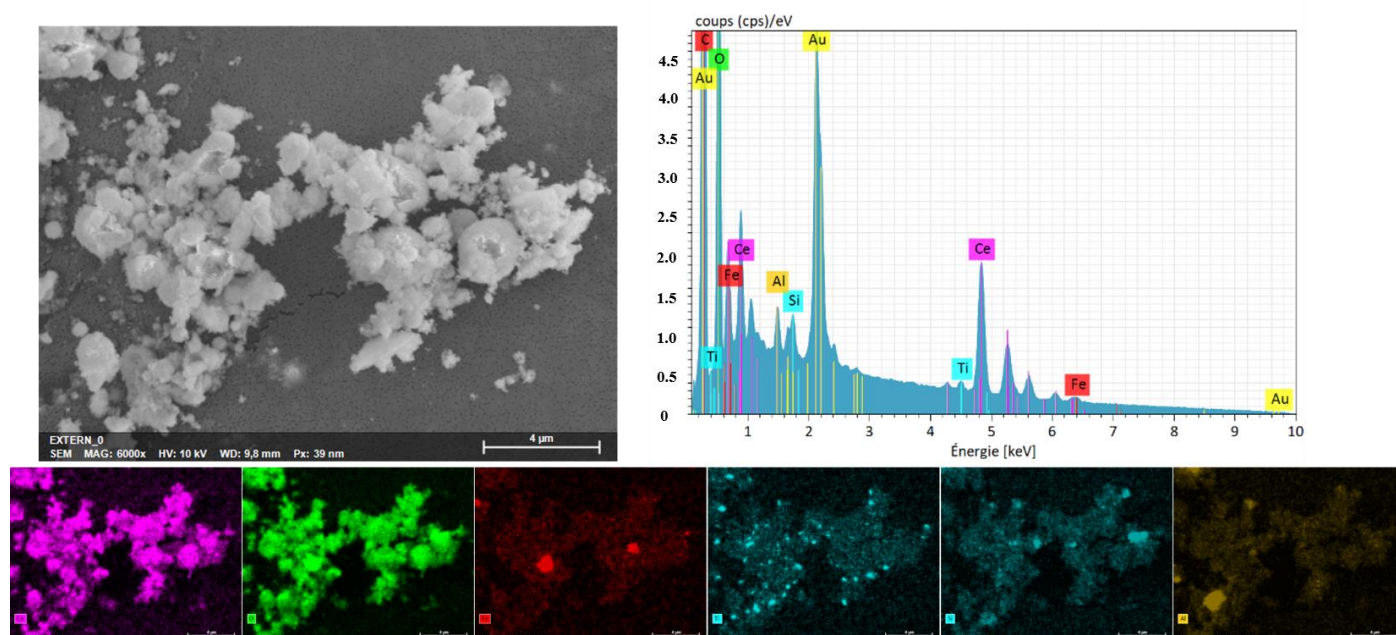
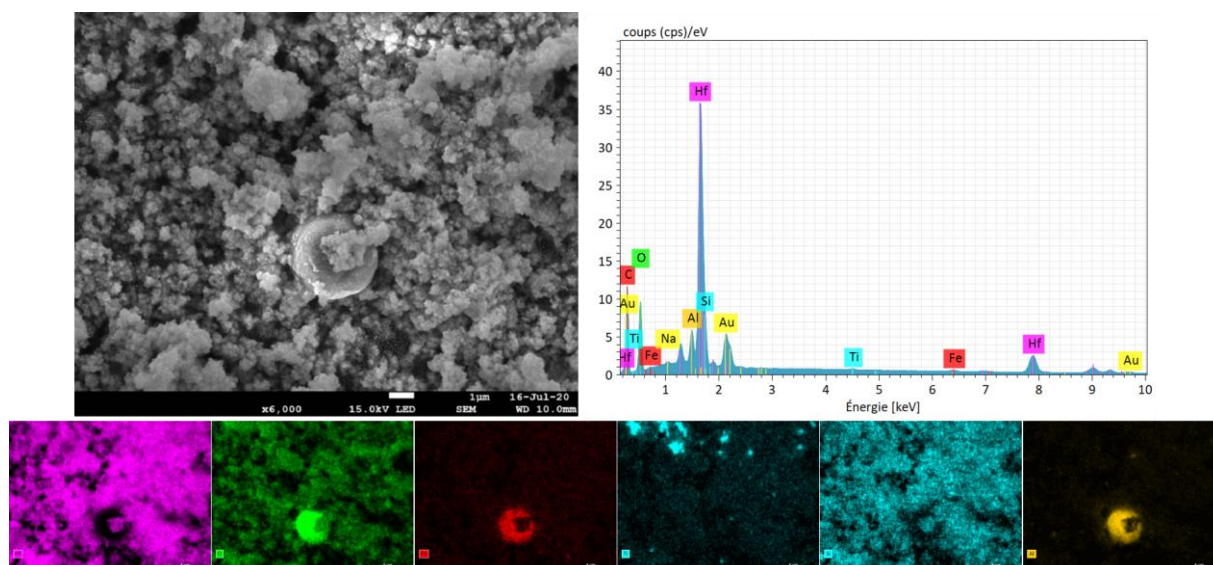


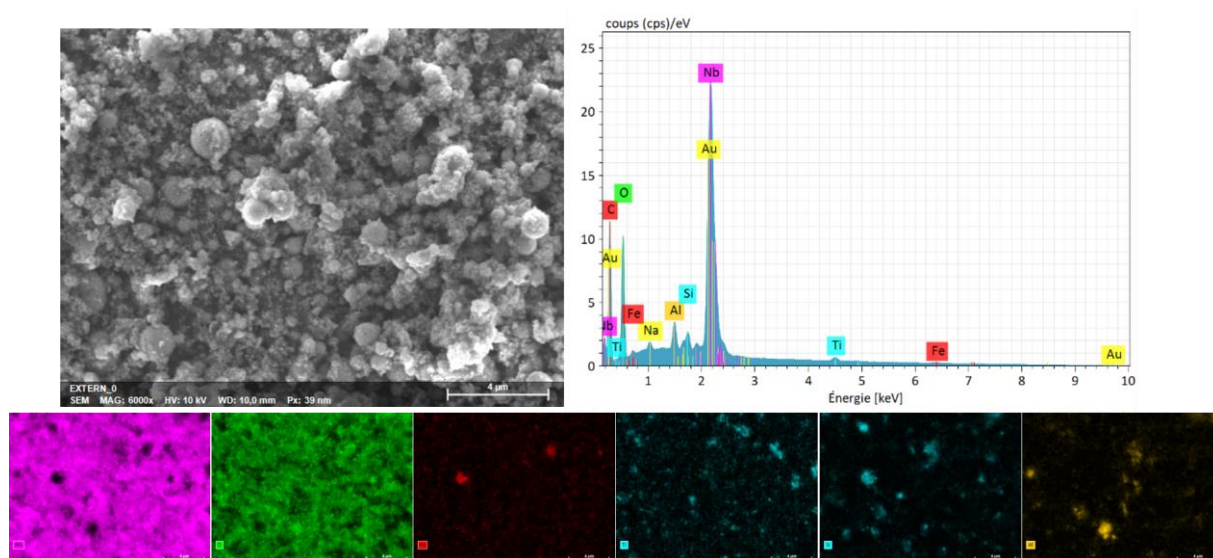
Figure S1. SEM (top) and TEM (down) low magnified images of pristine oxide ceramics: (A) CeO₂, (B) HfO₂, (C) Nb₂O₅, and (D) In₂O₃.



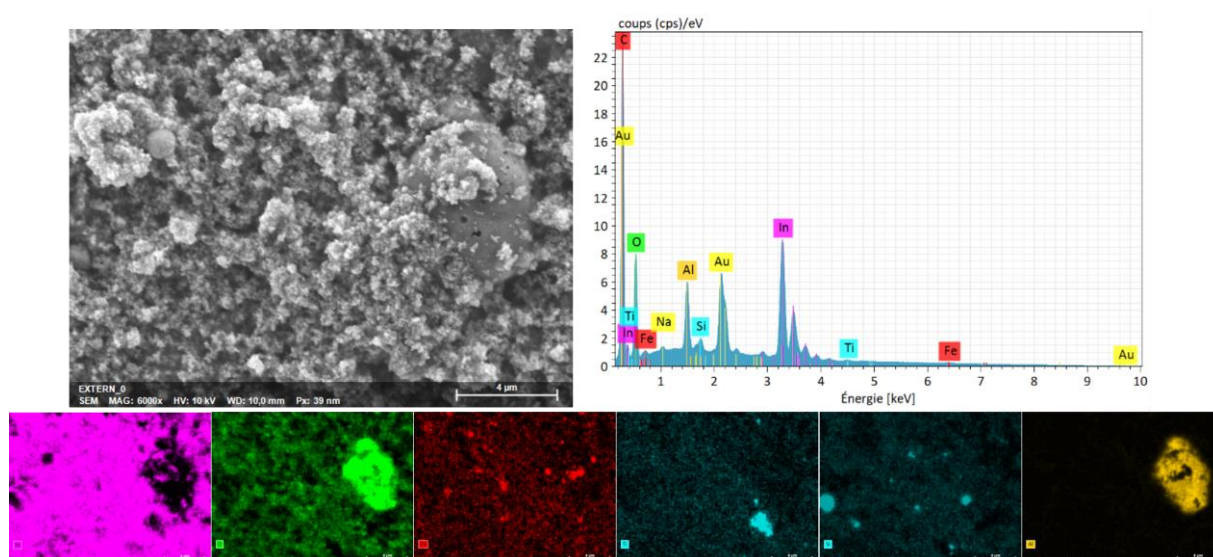
(A). EDS analysis of the CeO₂ material.



(B). EDS analysis of the HfO₂ material.



(C). EDS analysis of the Nb₂O₅ material.



(D). EDS analysis of the In₂O₃ material.

Figure S2. Elemental mappings of the different calcinated as-detonated oxide ceramics: **(A)** CeO₂, **(B)** HfO₂, **(C)** Nb₂O₅, and **(D)** In₂O₃. The qualitative analyses were carried out by using a scanning electron microscope (SEM—JEOL JSM-7900F) equipped with an energy-dispersive X-ray spectroscopy device (EDS—Bruker Quantax XFlash® 6/30). The iron species originates from rust (Fe₂O₃) present in certain places inside the detonation chamber. The titanium, silicon and aluminum species come from the paint (based on TiO₂, SiO₂ and Al₂O₃, etc.) that covers the inner walls of the detonation chamber. In a global point of view, the different oxide ceramics were made of the ceramic-salt derived metal (Ce(SO₄)₂·4H₂O, HfOCl₂·8H₂O, C₁₀H₅NbO₂₀·xH₂O, and In(OOCCH₃)₃) accompanied by some traces of impurities identified as coming from the detonation chamber. While oxide ceramics were constituting of nano- and micron-sized (≤1 μm) particles, impurities were represented by particles exhibiting a size largely higher than 1 μm.