Reaction sintering of UHTC-CNT and UHTC-graphite composites

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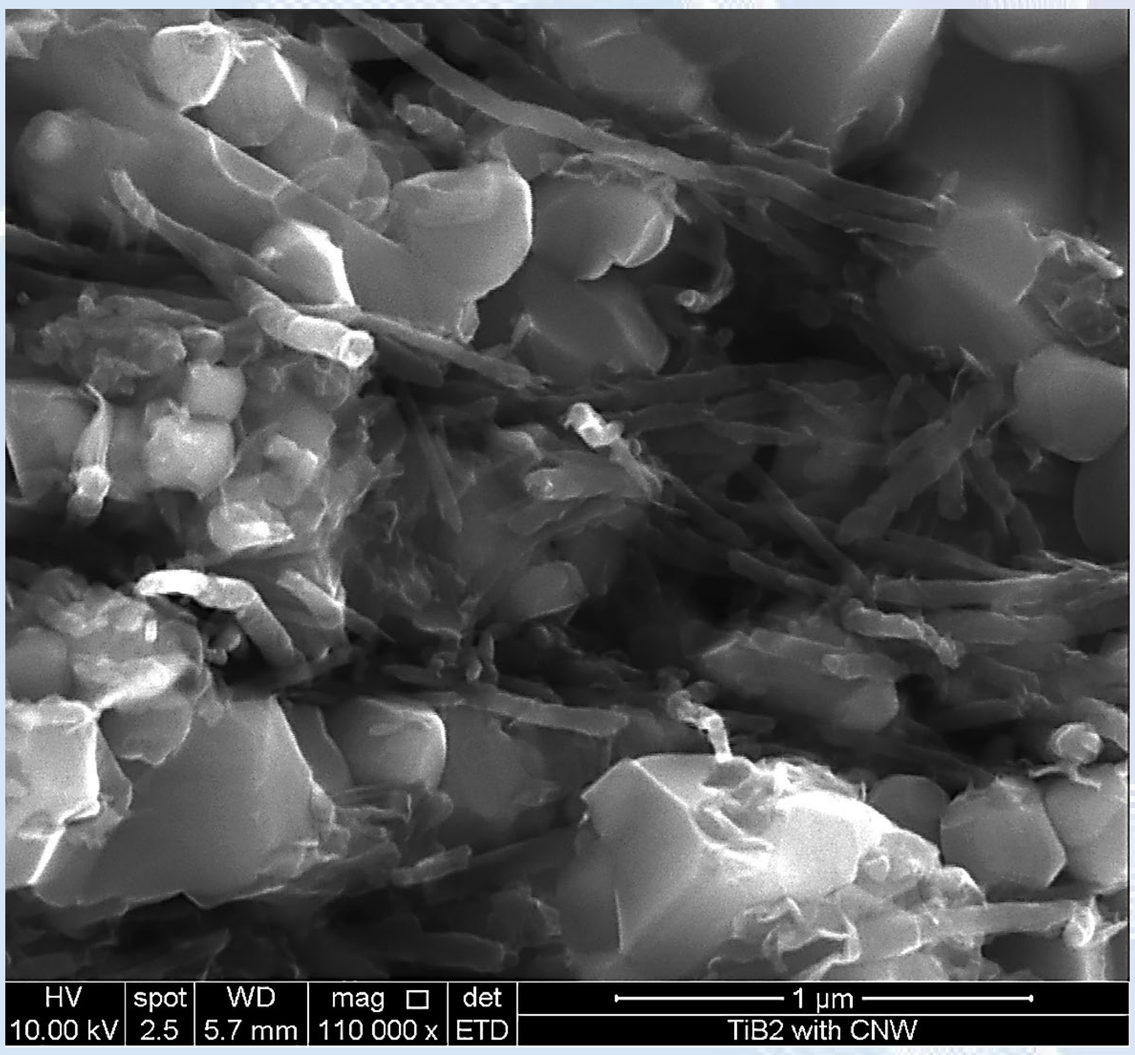
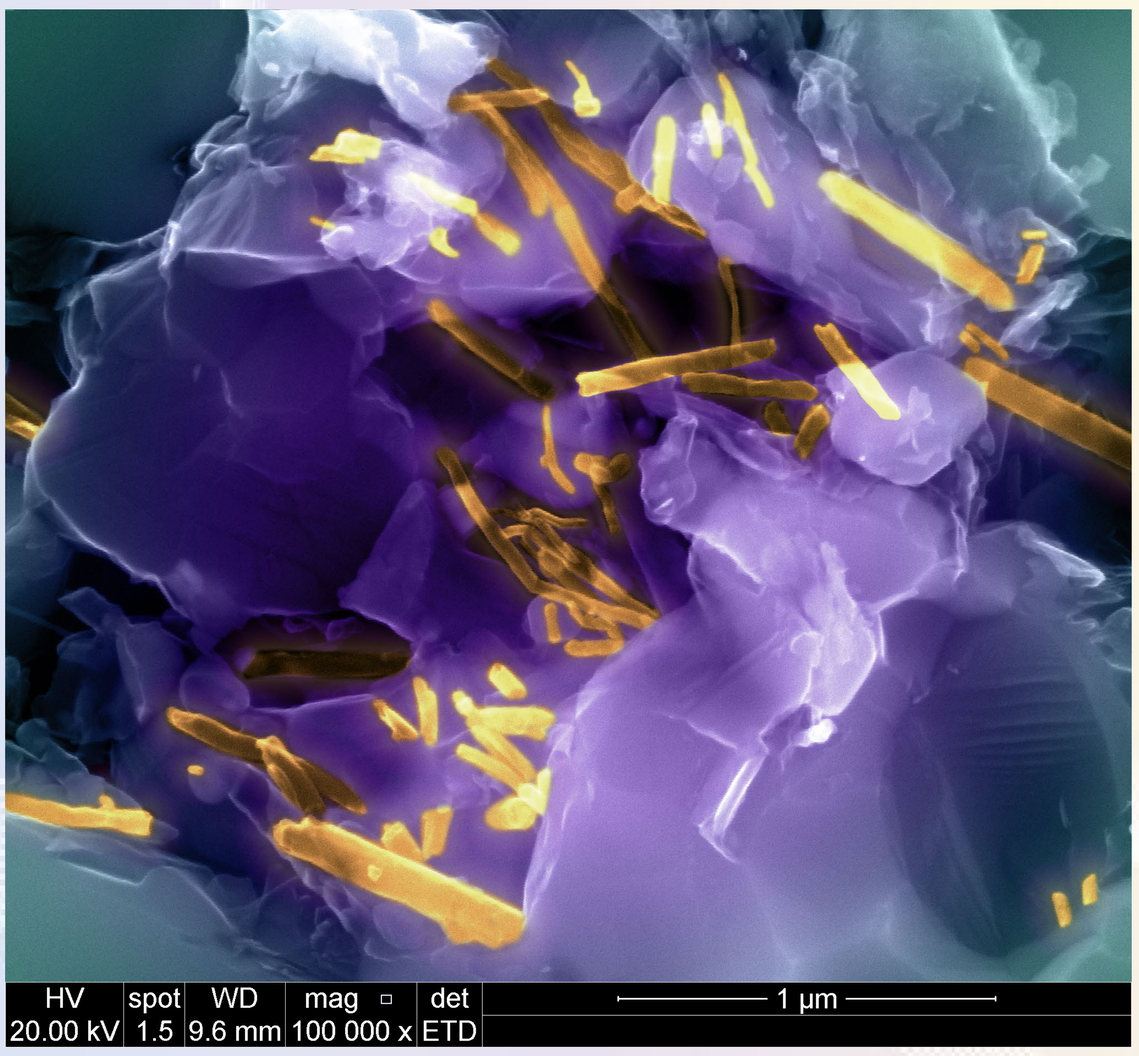
Ultra-high-temperature ceramics with carbon nanotubes

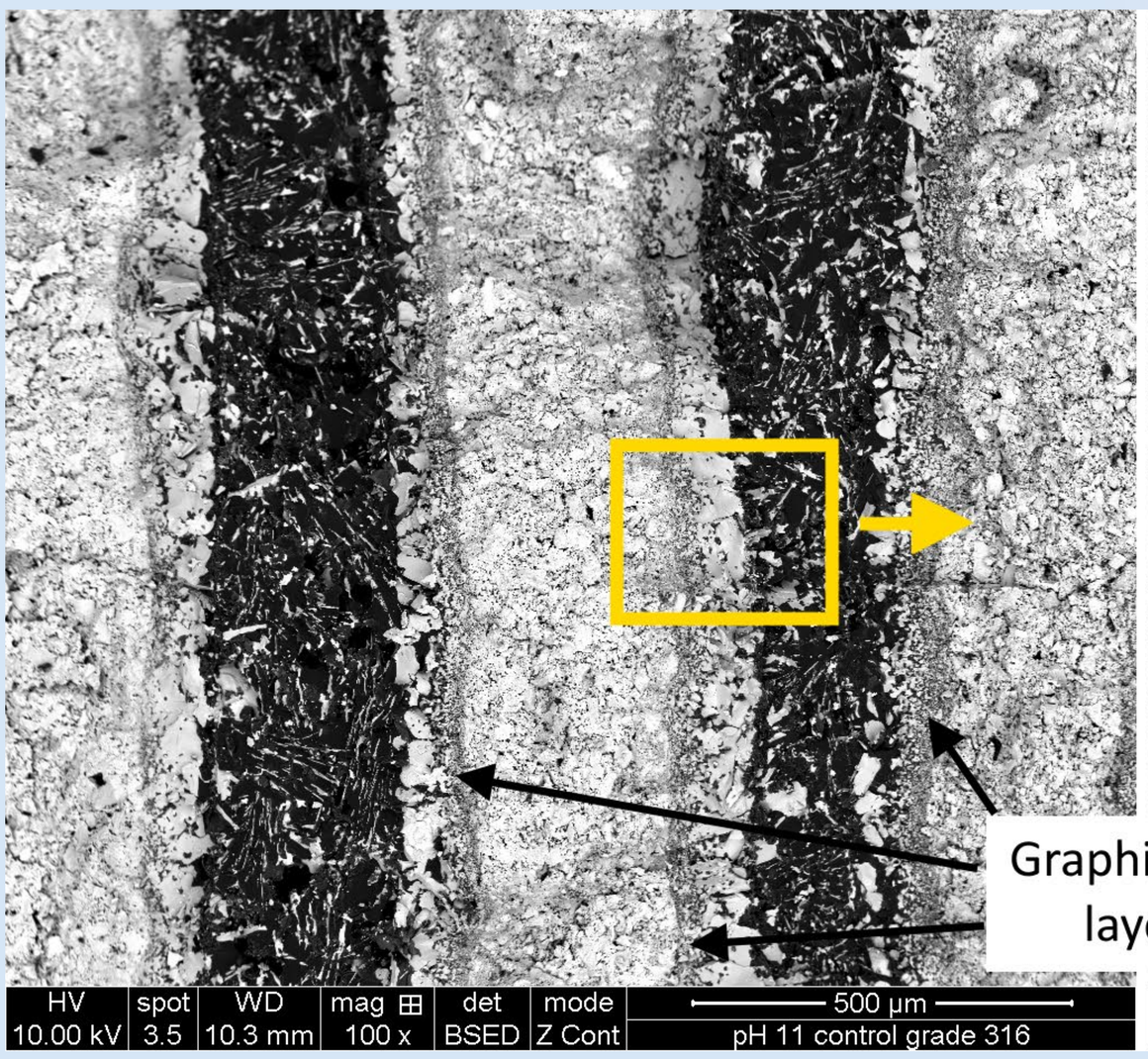


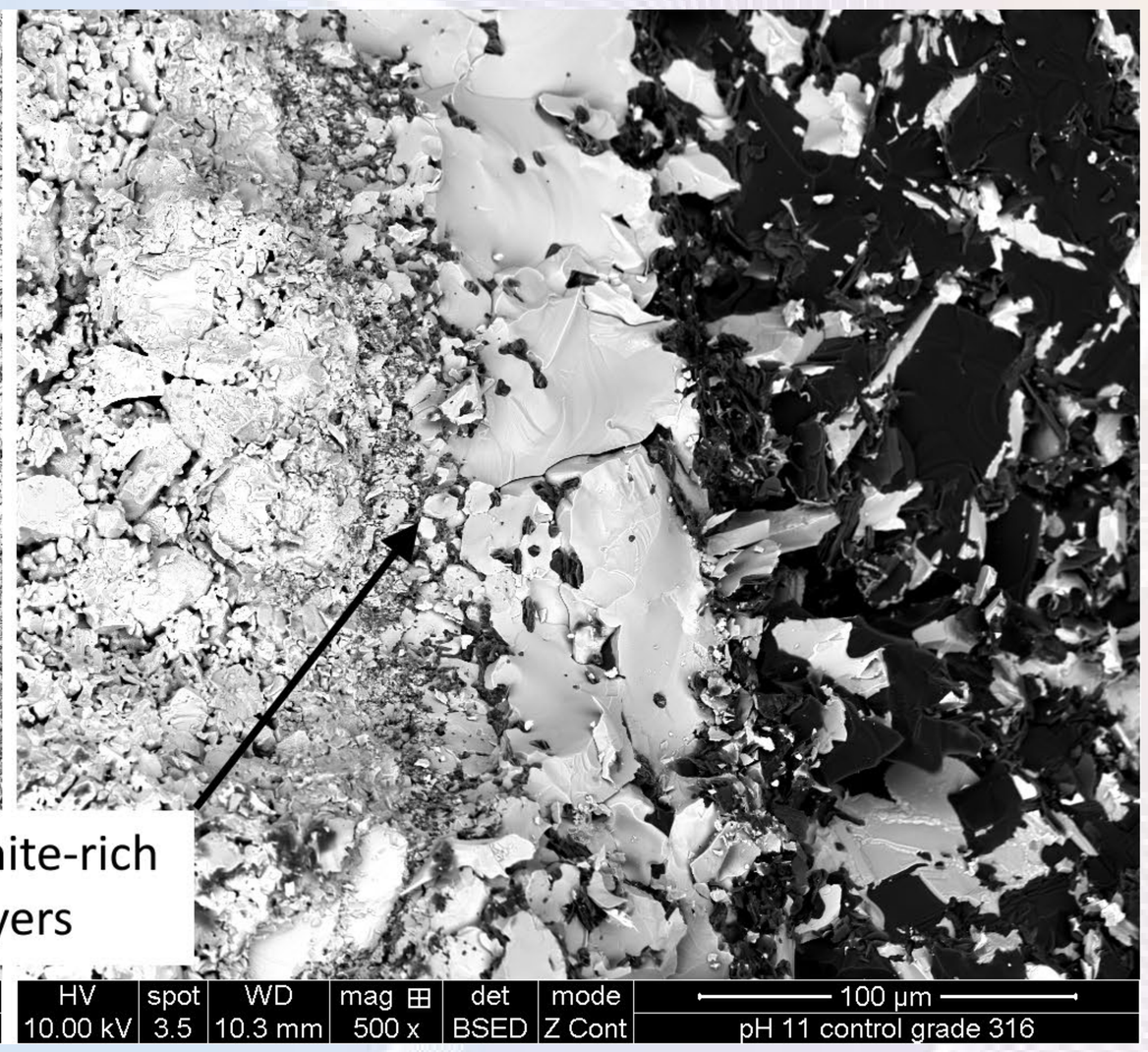
TiB_2 - SiC - CNT
Density - 100%
Toughness - 6.2 MPa·m$^{1/2}$



ZrB_2 - SiC - CNT
Density - 100%
Toughness - 6.8 MPa·m$^{1/2}$

Layered B_4C-C-TiB_2 composites for new generation armor plates





Superhard B_4C and TiB_2 besed layers alternating with graphite-rich soft ones would provide essential bullet-proof effect with impact crack formed in the superhard layers being blunted and suppressed in the soft ones

Conclusions

- ✓ A reactive hot-pressing method provide a possibility of fast sintering and allows CNTs to survive during the densification process
- ✓ Carbon nanotubes improved UHTC matrixes toughness and thermal shock resistance
- ✓ Heteromodulus layered ceramics possess advanced armor properties