Phase changes of W-Co powder System as Mechanical alloying condition

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There were recently many efforts to fabricate the nano-powder of WC-Co by mechanical alloying(MA). MA process is known very simple and economical process to fabricate nano-particle. however Sintering properties of MAed WC-Co powder are changed as being namo-particle or nano-crystallized particle of WC. it is not also clear whether MAed WC-Co powder is nano-particle or nano-crystallized particle. In this study, WC-Co powders were fabricated by MA as two additive conditions of composition and the phase changes were analyzed respectively.

The microstructure and phase change of MAed W-Co were analyzed at first. MAed W-Co powder mixed with Graphite to make WC-Co powder and then re-MAed. The re-MAed(WCo-C) powder compared with MAed W-C-Co powder which was MAed tungsten, graphite and cobalt powder from first stage. Above both carburized powders were analyzed phase behavior and the formation process. It were identified that Co in MAed W-Co formed solid solution in W and the crystalline size in MAed WCo-C powder was lower than MAed W-C-Co powder.