(19-023) - Characterization of WC-Co cermets with different binder contents for metal-ceramic brazing drilling inserts

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Tungsten carbide (WC) is a popular material choice for manufacturing tools, dies and drill bits because of its outstanding resistance to wear, shock, corrosion and abrasion. However, its brittle behavior and poor in machinability are major drawbacks, which can be overcome by introducing a metal binder, such as cobalt or nickel. Often these materials are known as a hard metal or cermet. Metal-caramic interfaces are present in tricone bits for oil well and mining drilling operations. Brazing methods have been used widely for metal-carbide joining. Most active filler alloys contain a reactive element, such as titanium, which reacts with the carbide promoting wettability, spreading and adhesion. During the brazing process, the bulk cermet microstructure may be affected on its final properties. In this work, SEM/EDS, XRD and mechanical tests (hardness and flexural) were used to characterize and study the effect of cobalt content (6 and 12%wt) in WC-Co hard metal.