Cobalt substitution in the hard metal industry: the need of a sustainable choice

Raquel Lizarraga Jurado (raqli@kth.se)

Cobalt is currently in the list of critical raw materials compiled by the European Commission because of its great economic significance and the lack of major production in Europe. More than half of the global supply originates from the politically unstable Democratic Republic of Congo (DRC). Additionally, reports of irresponsible mining practices in DRC and also health issues related to Cobalt in the powder form have pushed various industry sectors, such as hard metals and lithium-ion batteries, to find a replacement for Cobalt in their products.

However, finding alternatives to Cobalt is not an easy task since ideally production processes and quality controls should be altered as little as possible due to the substituting material. Researchers at the materials science and engineering (MSE) department at KTH have partnered with world-leading hard metal industries in Sweden e.g. Sandvik, Seco and Epiroc to address this problem. During the last decade, several research projects with the aim to develop Co-free alternative binders for hard metals have been initiated at MSE. These efforts have led to the upscale of a hard metal
prototype and the construction of a general quality control for alternative binders. In this presentation I review these research efforts from production, characterization and computational modeling of sustainable alternatives to Cobalt in the hard metal industry.