**Supporting Information**

**Tribological properties of NiAl matrix composite coatings synthesized by plasma spraying method**

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Fig. S1 Morphological of powders: (a) NiAl, (b) Cr2O3, (c) Mo and (d) Ag.

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Fig. S2 SEM image of mixed powders and corresponding element mappings.

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Fig. S3 Micrographs of surfaces of composite coatings: (a) NA, (b) NA3, (c) NA5; (d-i) are the element mappings of NA5.

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Fig. S4 Raman spectra of within the wear track of NA5 composite coatings tested at different temperatures.

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Fig. S5 XRD patterns of products on the surfaces of NA3 (a) and NA5 (b) composite coatings tested at 900 oC.

Fig. S5 shows the XRD patterns of products on the surfaces of NA3 and NA5 composite coatings at 900 oC. It can be seen that the Ag2MoO4, NiMoO4 and NiO are the main components in composite particles. The diffraction peaks of NiMoO4 weaken and Ag2MoO4 peaks strengthen by the addition of silver. It could be concluded that the molybdenum reacts with silver firstly and then reacts with nickel when the content of silver decreases.

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