Supporting information:

Reactive magnetron sputtered wear resistant multilayer transition metal carbide coatings: Microstructure and tribo-mechanical properties

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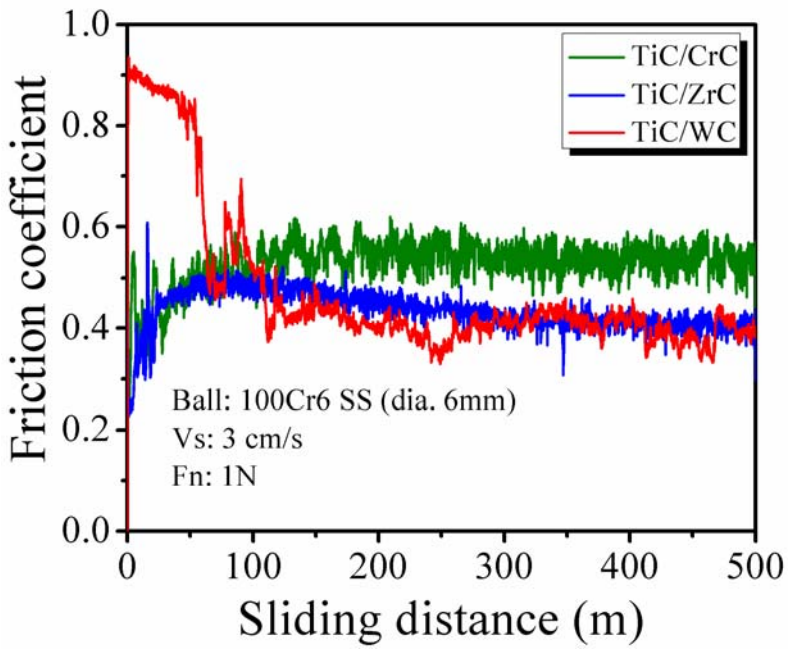

Figure S1. Friction coefficient curves of different TMC multilayer coatings.

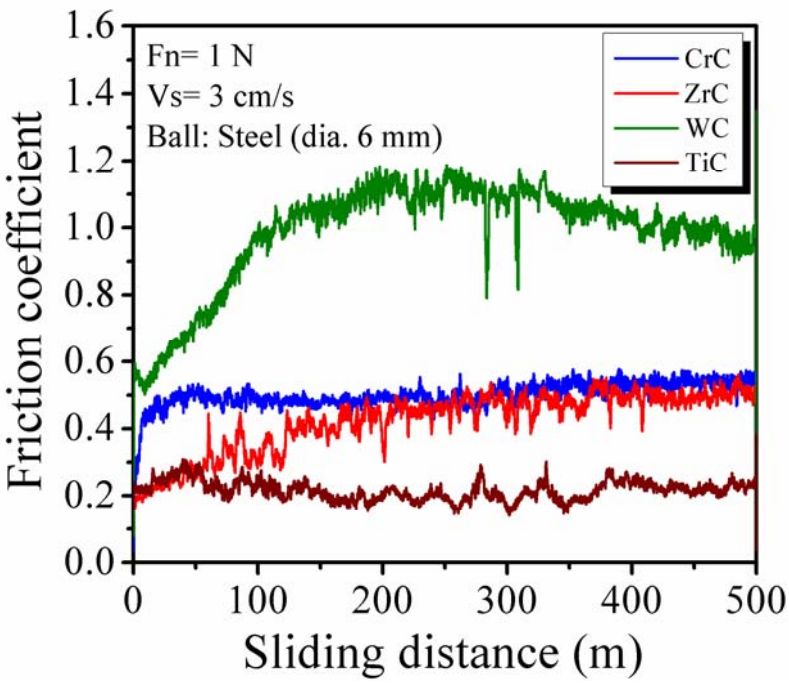

Figure S2. Friction coefficient curves of different TMC single layer coatings.

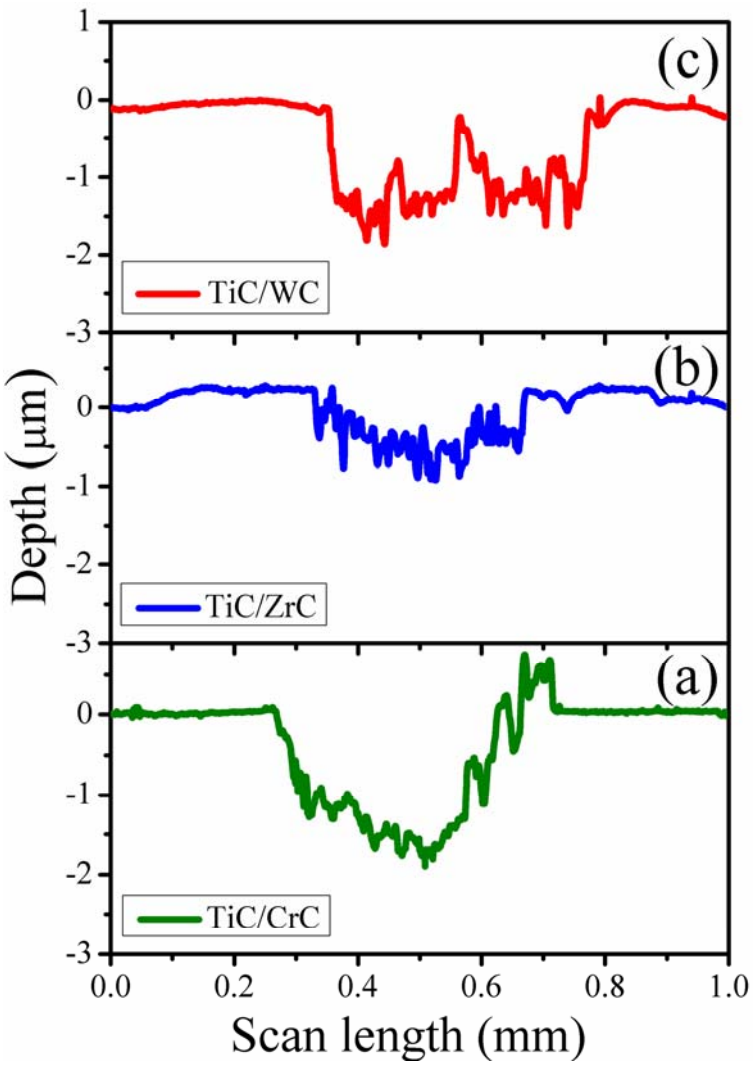

Figure S3. Wear profile analysis of TMC multilayer coatings on steel substrates.

(a) TiC/CrC, (b) TiC/ZrC and (c) TiC/WC.

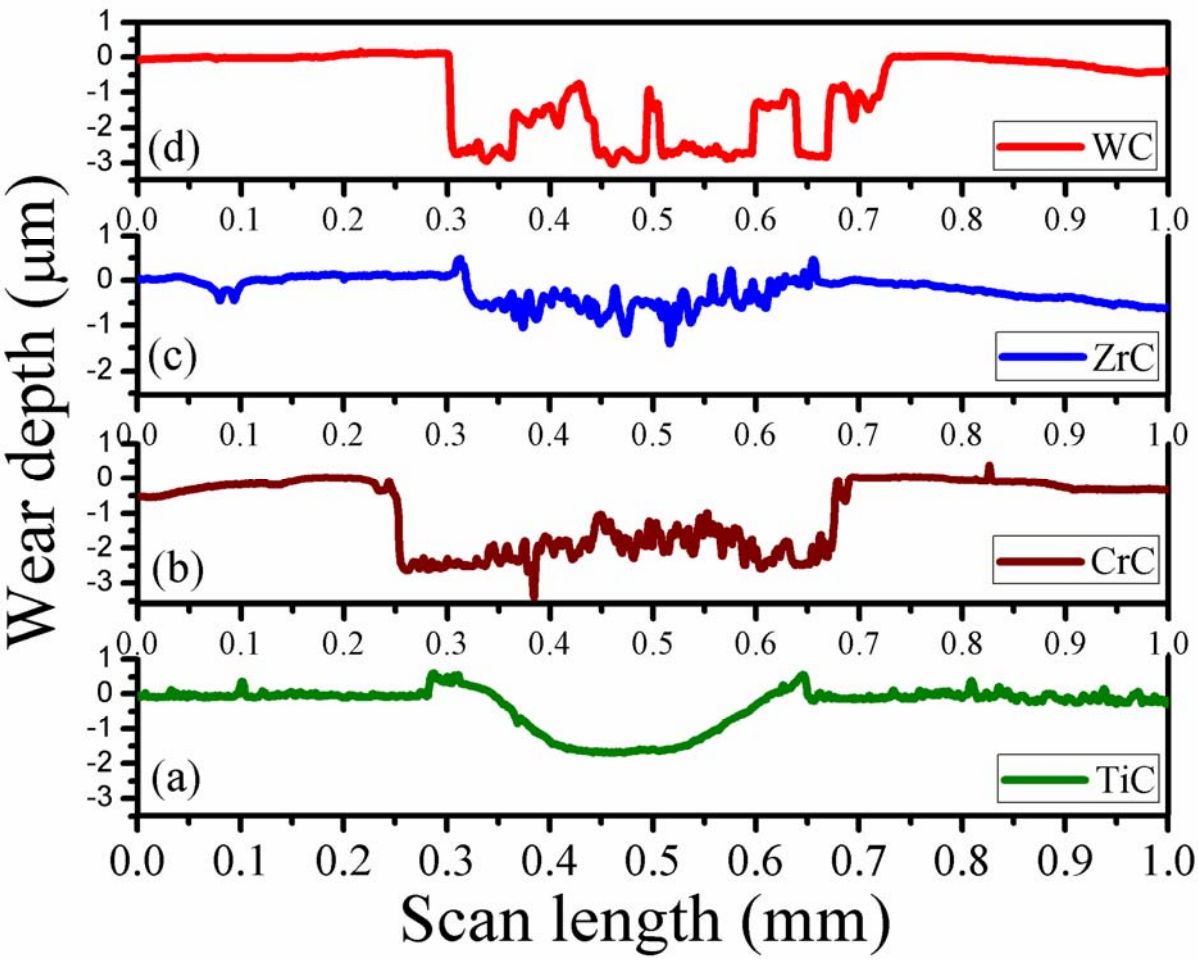

Figure S4. Wear profile analysis of TMC single layer coatings on steel substrates.

(a) TiC, (b) CrC and (c) ZrC and (d) WC.

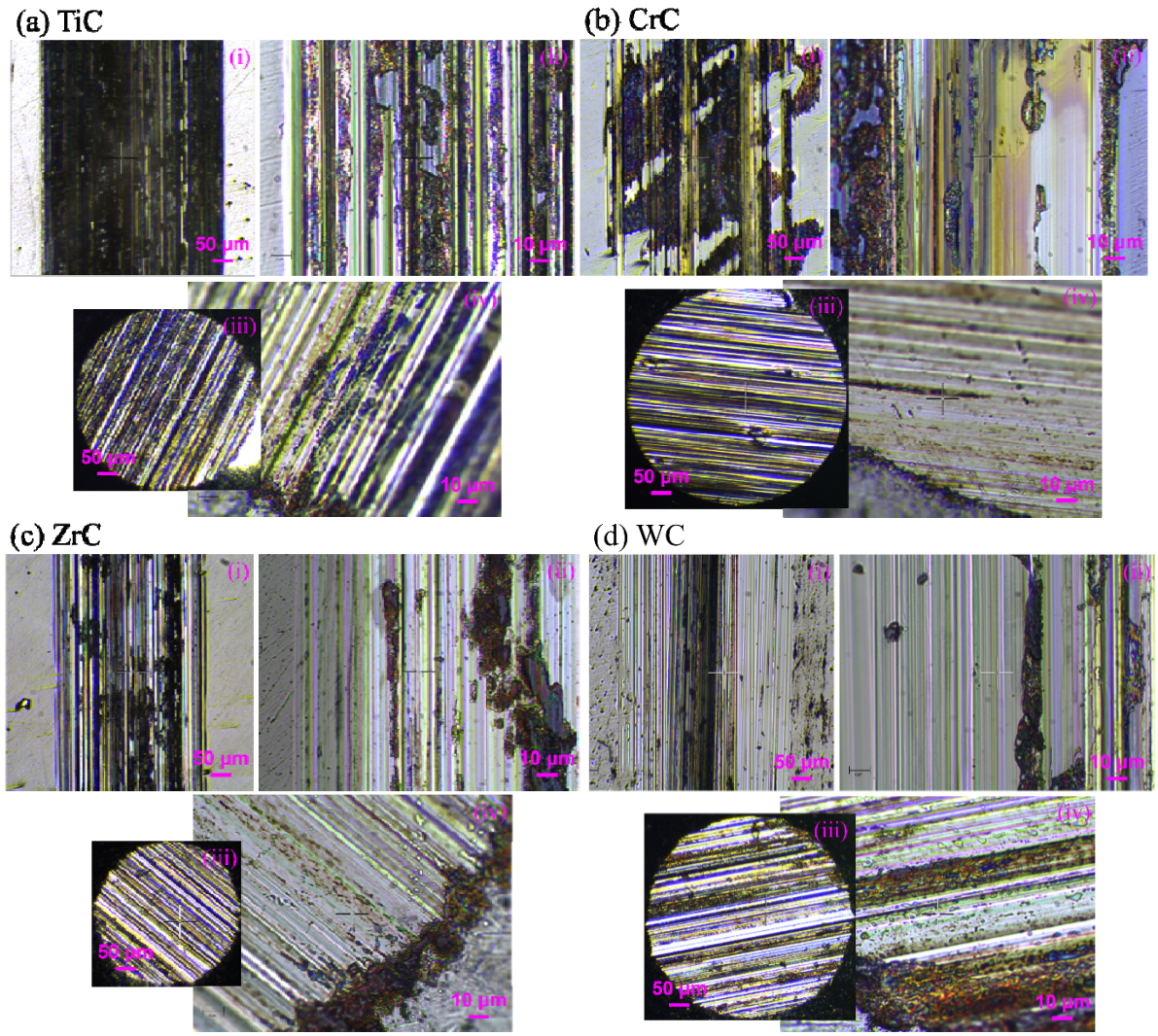

Figure S5. Wear micrographs on TMC coatings deposited on steel substrates. (Scar on coatings at (i) 5x & (ii) 50x and, scar on steel ball (iii) 5x & (iv) 50x magnifications).

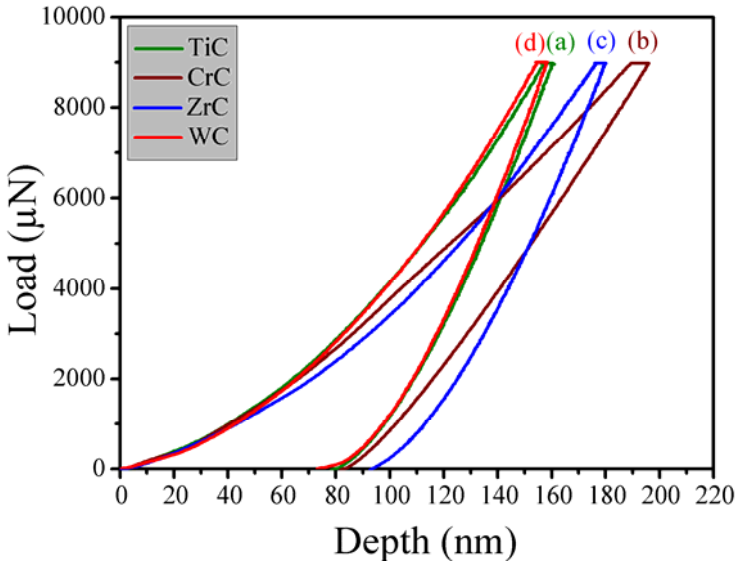

Figure S6. Load-displacement curves of single layer TMC coatings.

Table S1. Nanomechanical properties and wear rates of single layer TMC coatings on steel substrate.

Sample	**Hardness (H) (GPa)**	**Reduced elastic modulus (E_r) (GPa)**	**H^3/E^2 (GPa)**	**Wear rate (k) (mm^3/Nm)**
(a) TiC	18.05 ± 1	208.08 ± 15	0.135 ± 0.010	4.89×10^{-5}
(b) CrC	7.60 ± 2.2	138.20 ± 19	0.022 ± 0.007	1.60×10^{-3}
(c) ZrC	16.70 ± 1	187.50 ± 10	0.132 ± 0.020	2.79×10^{-8}
(d) WC	23.90 ± 2	250.03 ± 24	0.218 ± 0.030	8.15×10^{-4}

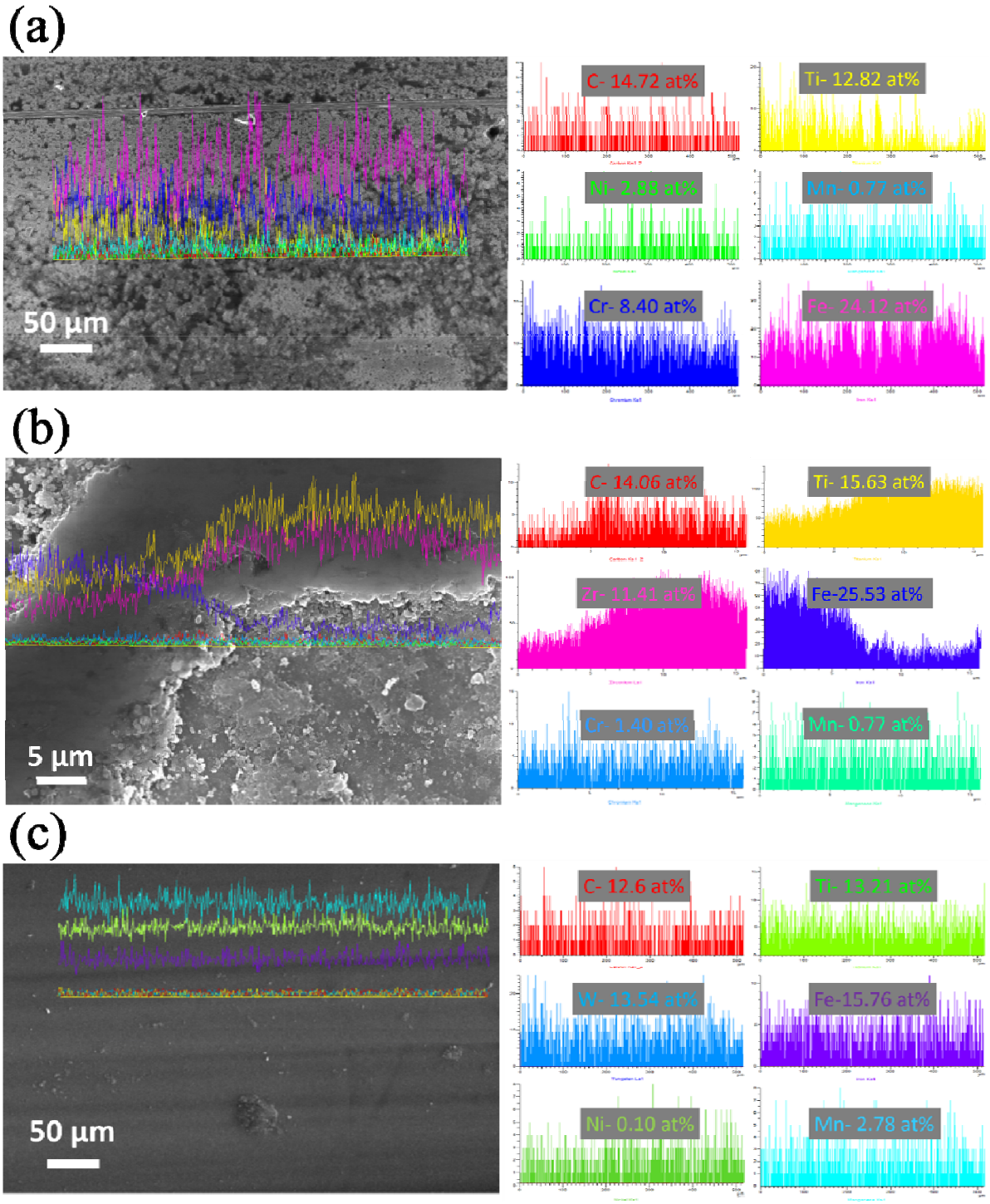

Figure S7. EDAX elemental profile analysis inside the wear track of (a) TiC/CrC, (b) TiC/ZrC and (c) TiC/WC multilayer coatings.