

Investigation of the Tribological Properties of Hybrid Additive-Modified Water-Based Lubricating Fluid

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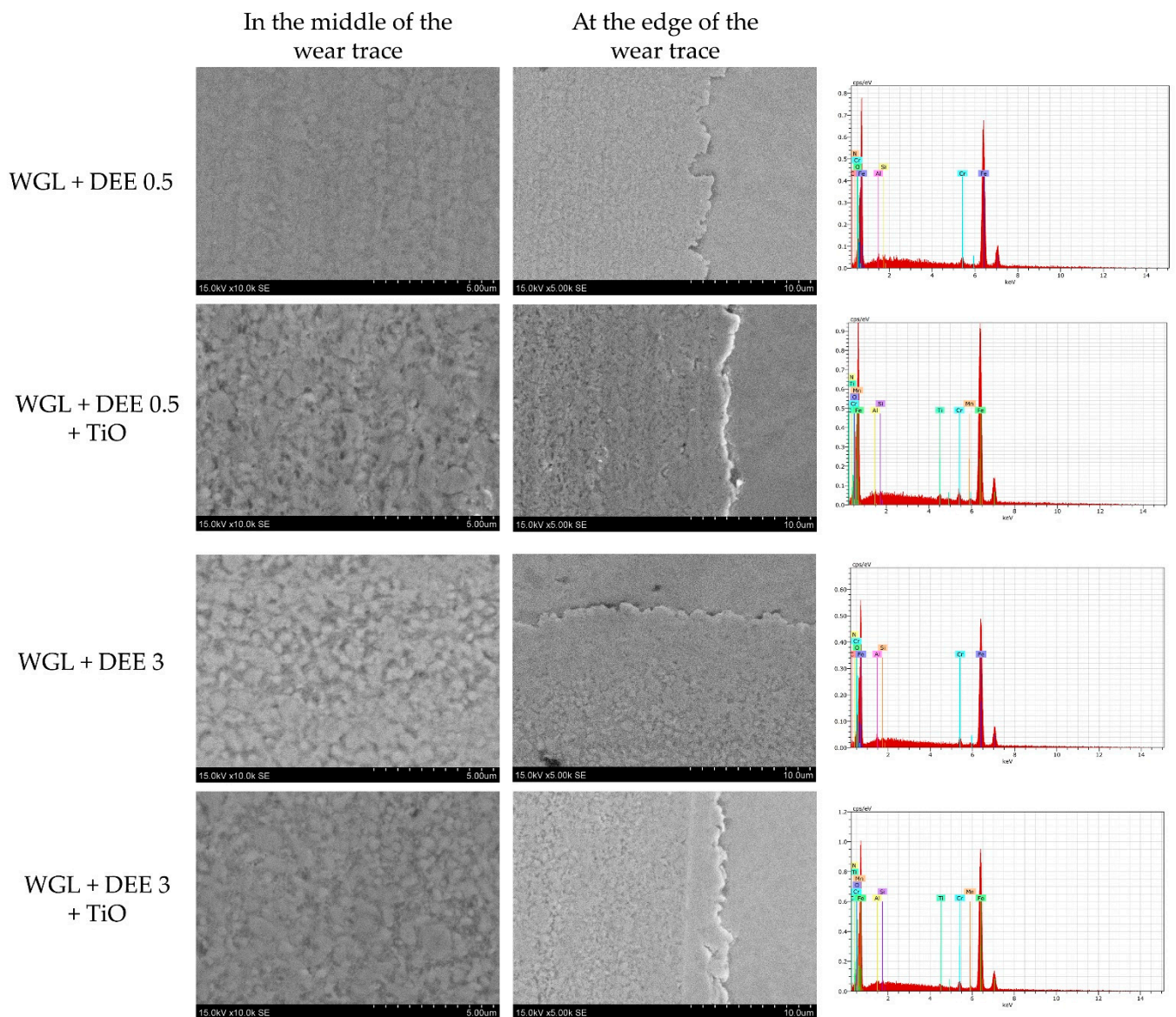


Figure S1. SEM images of the wear traces in the Alumina/Bearing steel friction pair and EDS graphs obtained when measuring the composition in the wear traces.

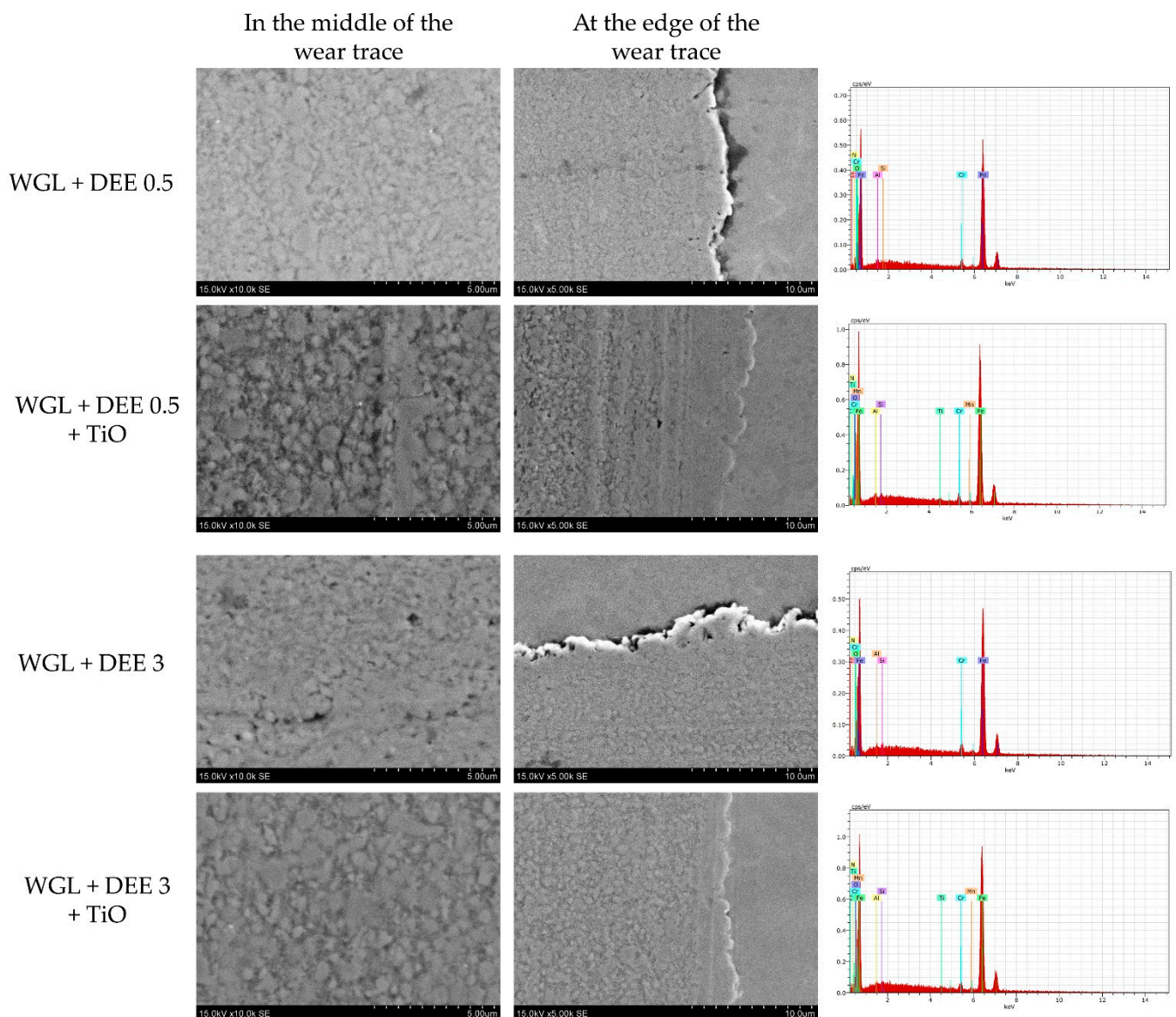


Figure S2. SEM images of the wear traces in the WC/Bearing steel friction pair and EDS graphs obtained when measuring the composition in the wear traces.

Table S1. Atomic [%] composition of the wear traces on the plate observed after lubrication of Alumina/Bearing steel friction pair with protic ionic liquid and hybrid additive modified base fluid.

Elements of interest	WGL+DEE 0.5	WGL+DEE 0.5+TiO	WGL+DEE 3	WGL+DEE 3+TiO
C	1.27	0.64	1.13	0.50
O	4.22	3.99	5.32	3.41
N	2.55	3.24	2.80	1.20
Ti	-	1.01	-	0.85
Other	Balance			

*Other elements refer to Fe, Cr, Si, Al, and Mn.

Table S2. Atomic [%] composition of the wear traces on the plate observed after lubrication of WC/Bearing steel friction pair with protic ionic liquid and hybrid additive modified base fluid.

Elements of interest	WGL+DEE 0.5	WGL+DEE 0.5+TiO	WGL+DEE 3	WGL+DEE 3+TiO
C	1.35	2.21	1.59	1.74
O	2.98	5.50	3.98	2.90
N	3.12	1.19	4.80	2.67
Ti	-	1.08	-	1.25
Other	Balance			

*Other elements refer to Fe, Cr, Si, Al, and Mn.