
Phosphorus Volatility Bench Test

ESCIT Meeting

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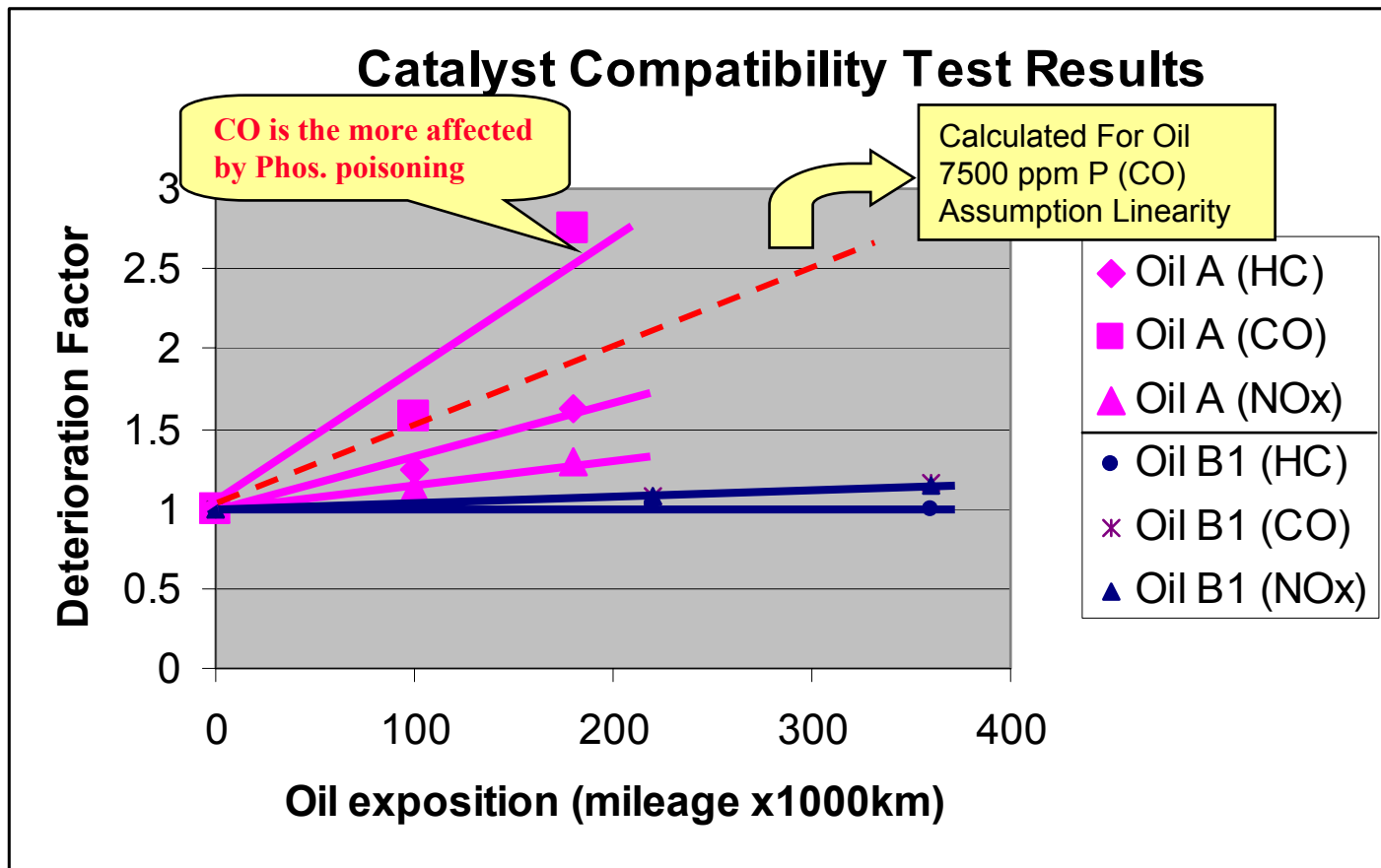
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Assessment of P volatility

- In our previous publications, several methods for measuring P volatility of engine oils were reported
 - TGA of pure additive – did not give representative results
 - Modified Noack (PEI_{250}) – P losses for some ashless compounds tended to be overstated
- Bench test conditions for measuring P volatility of engine oils should be similar to actual engine conditions, e.g.
 - Bulk oil in crankcase (~150C) for hours
 - Thin oil film on piston ring/liner (~250C) for seconds/minutes
(Amended with Ca measurement for the agreed calculation formula)
- Any Bench Test will have to demonstrate:
 - Ability to identify **high Phosphorus volatility** compounds under engine conditions
 - Ability to identify **low phosphorus volatility** compounds under engine conditions

Catalyst (TWC) compatibility Tests Results

	Oil A	Oil B1
S, ppm	4080	2000
P, ppm	1080	530
Ca, ppm	1590	2200
Mg, ppm	1000	0
Zn, ppm	1200	0



Current on-going Work:

- Ciba's bulk and thin film Phosphorus volatility Test are being run with Lubrizol received oil
- Ca measurement in order to report data based on agreed Calculation
- Ciba is evaluating application bench tests that could correlate to P volatility under:
 - Bulk oil in crankcase (~150C) for hours
 - Thin oil film on piston ring/liner (~250C) for seconds/minutes

Welcome any comments...

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