
Ciba Phosphorus Volatility Test (CPVT)

ESCIT Meeting

February 22nd , 2007

SouthWest Research

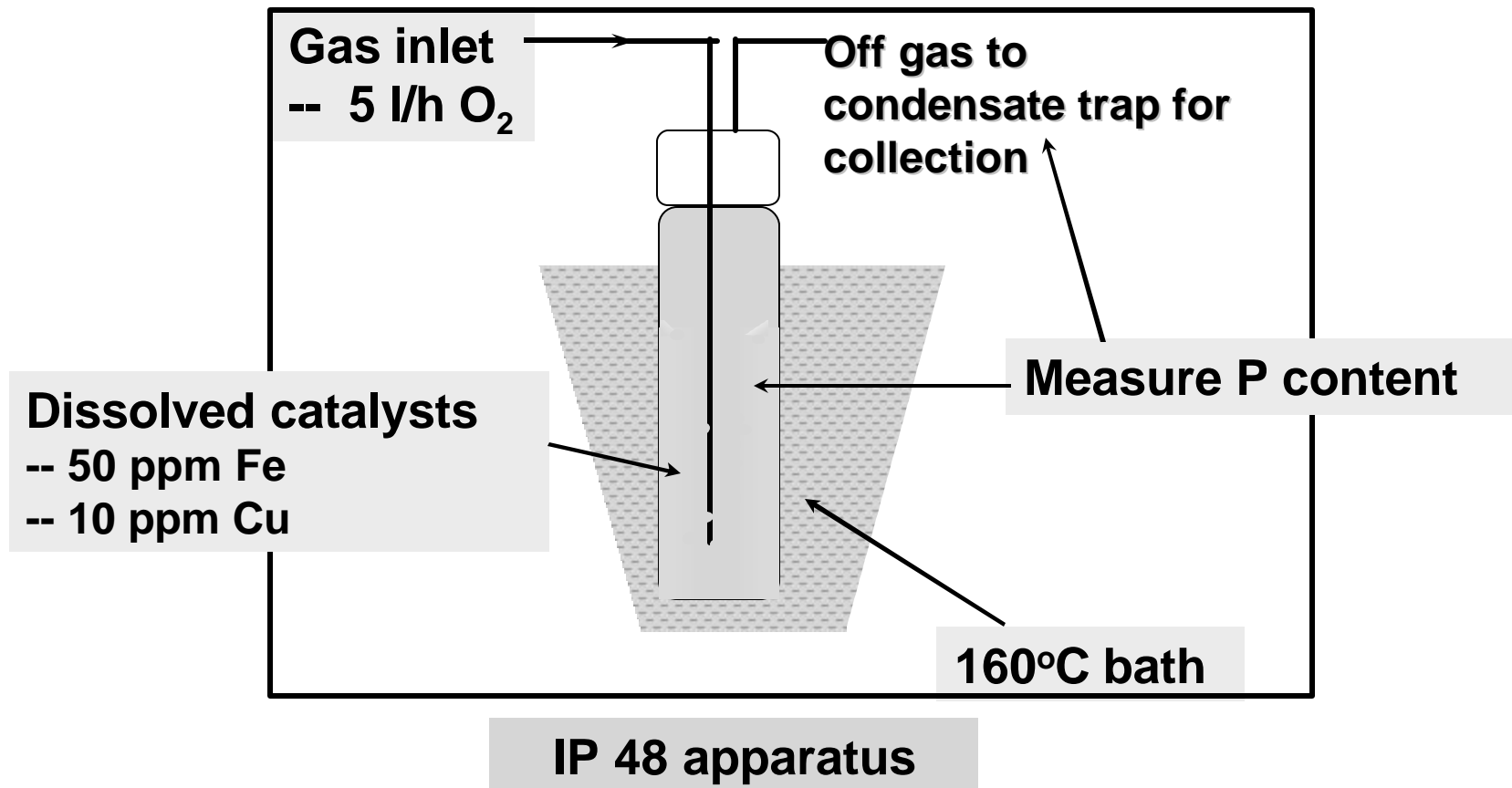
San Antonio, TX

Assessment of P volatility

- Overview Ciba Volatility Test
- Results using X-ray fluorescence (XRF) measurement technique (ASTM D4927)
- Results using inductively coupled plasma (ICP) measurement technique (ASTM D4951)
 - 3 % repeatability and a 10 % reproducibility
- Influence of time interval explored (8hr vs. 48 hr) at 160°C completed
- Future Work

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Realistic Exposure and Ageing conditions

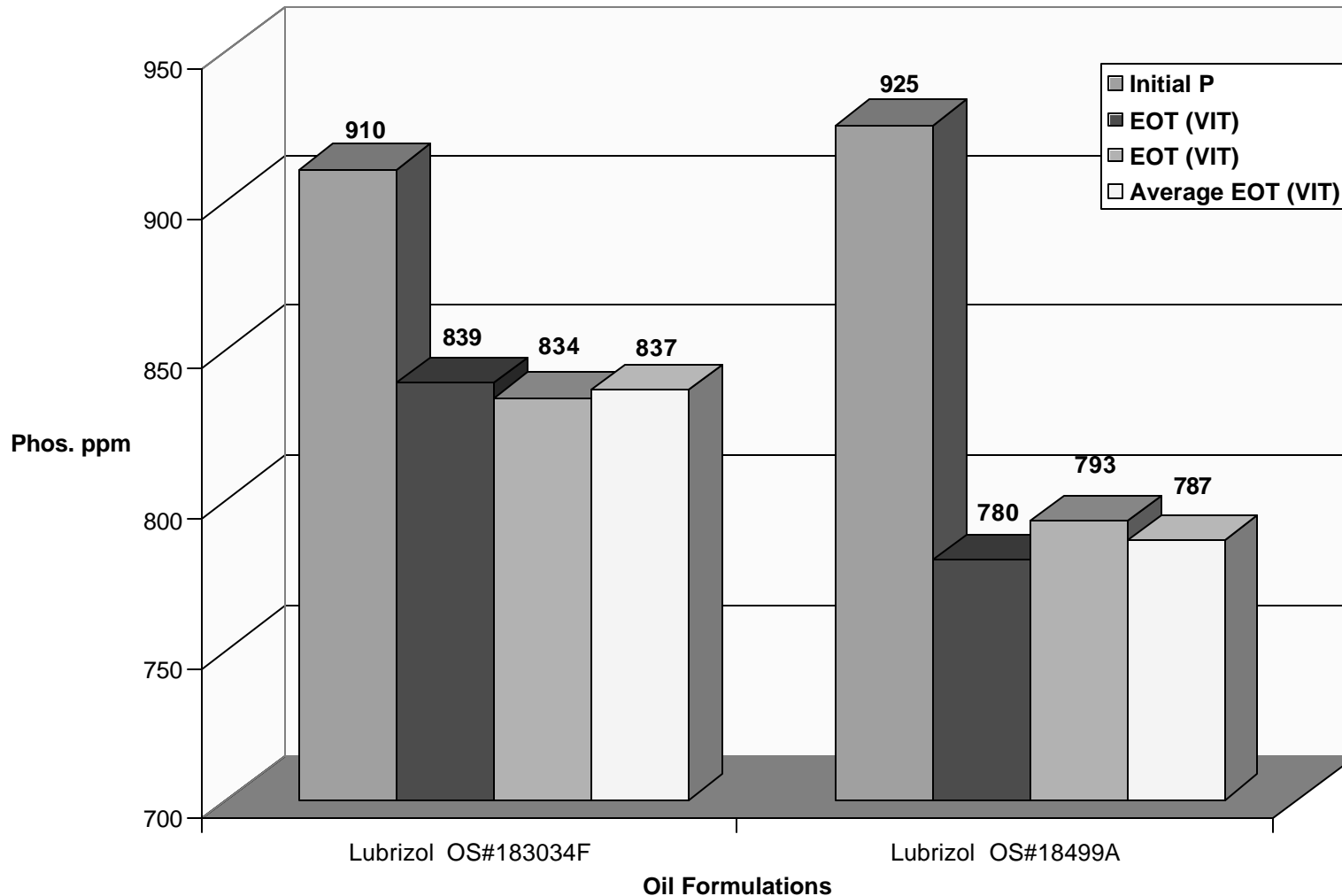


Bulk oil aging addresses the crankcase model



XRF Measurements Technique (ASTM D 4927)

Phosphorus Volatility in Ciba Phos. Volatilization Test (CPVT)



Current CPVT discriminates clearly P volatility with good reproducibility

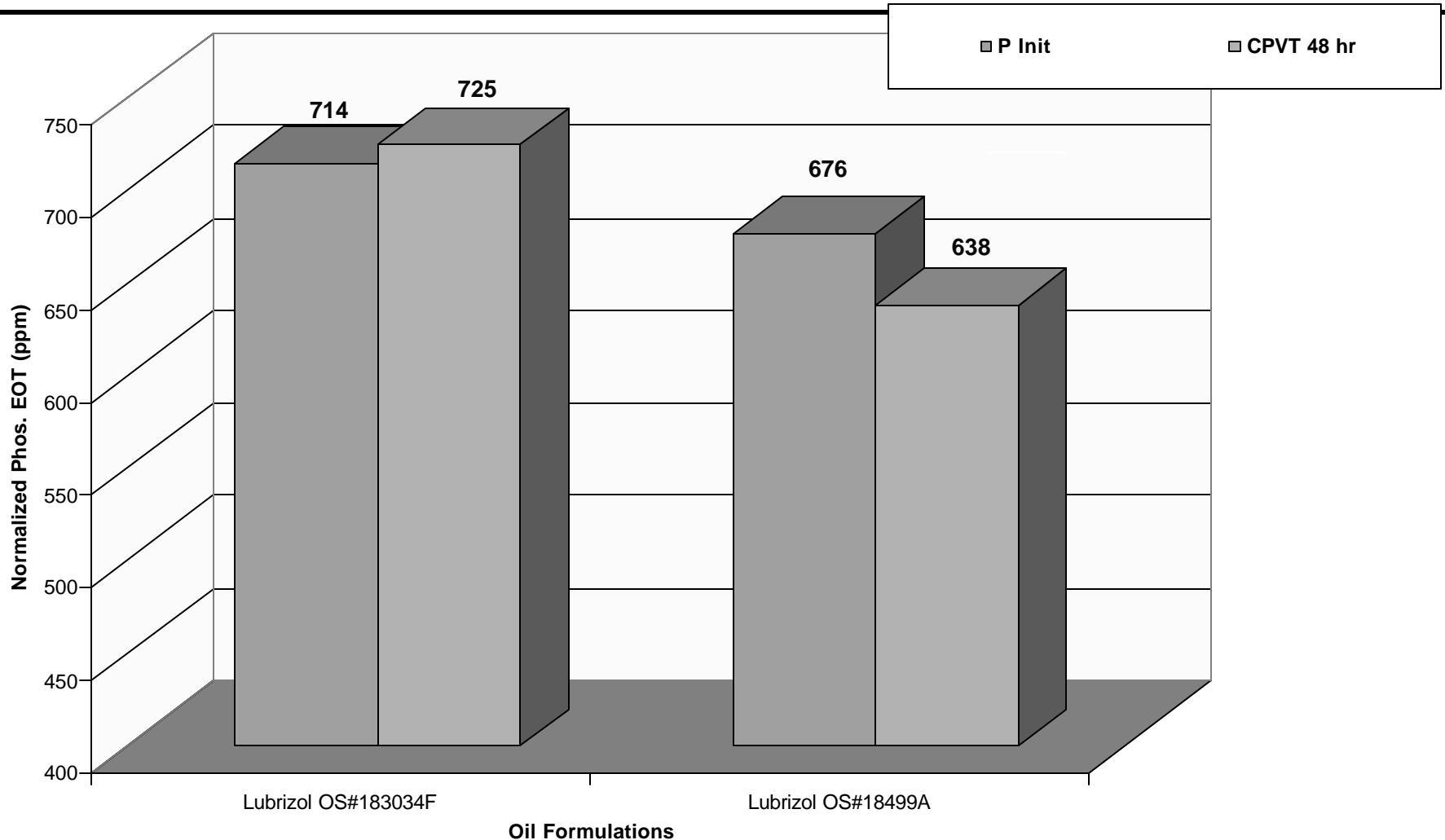
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ICP Measurements Technique (ASTM D 4951) Phosphorus Volatility in Ciba Phos. Volatilization Test (CPVT)



Significant difference between ICP and XRF but confirm CPVT discriminates P volatility in engine oil

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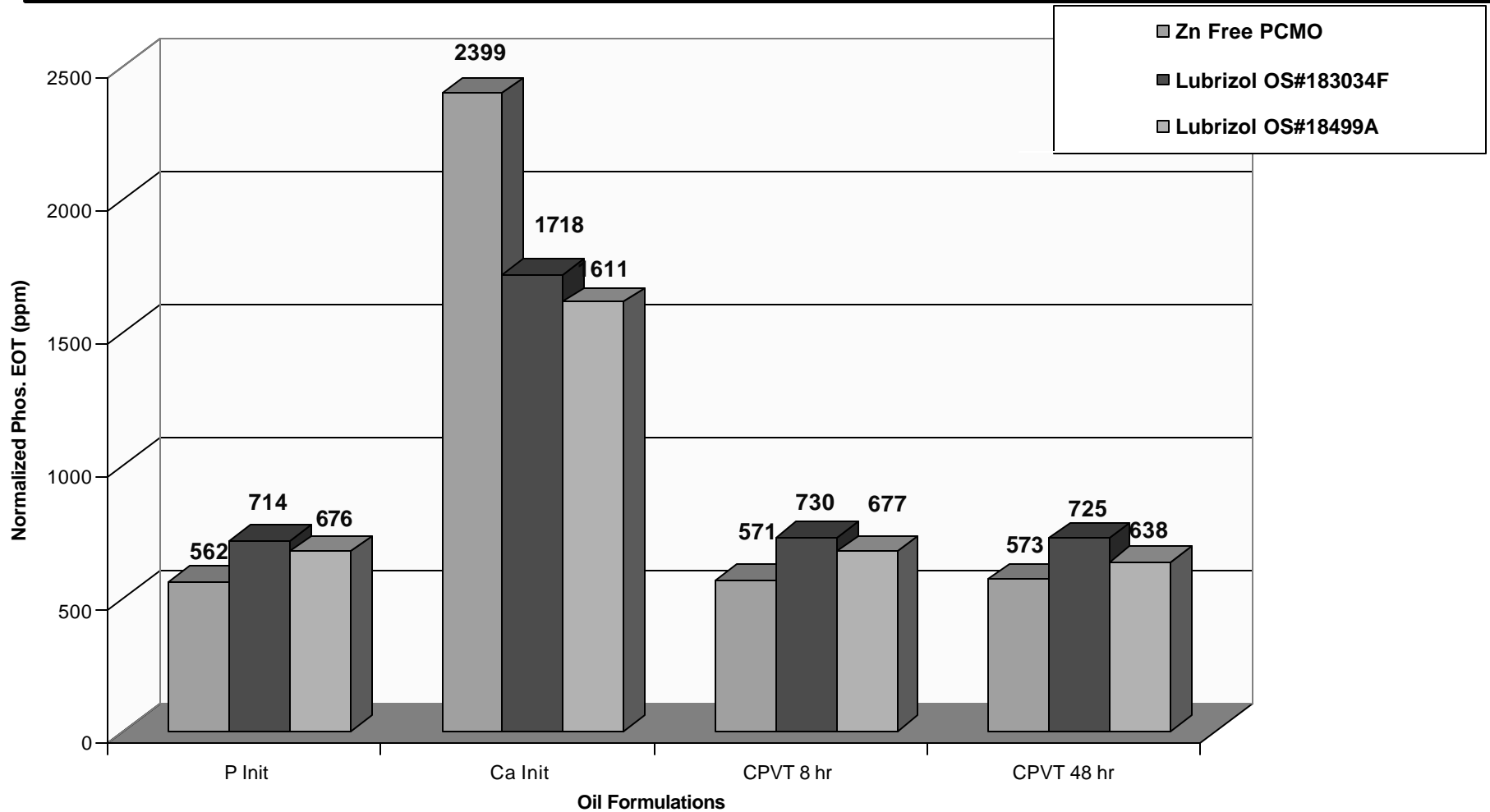
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ICP Measurements Technique (ASTM D 4951)

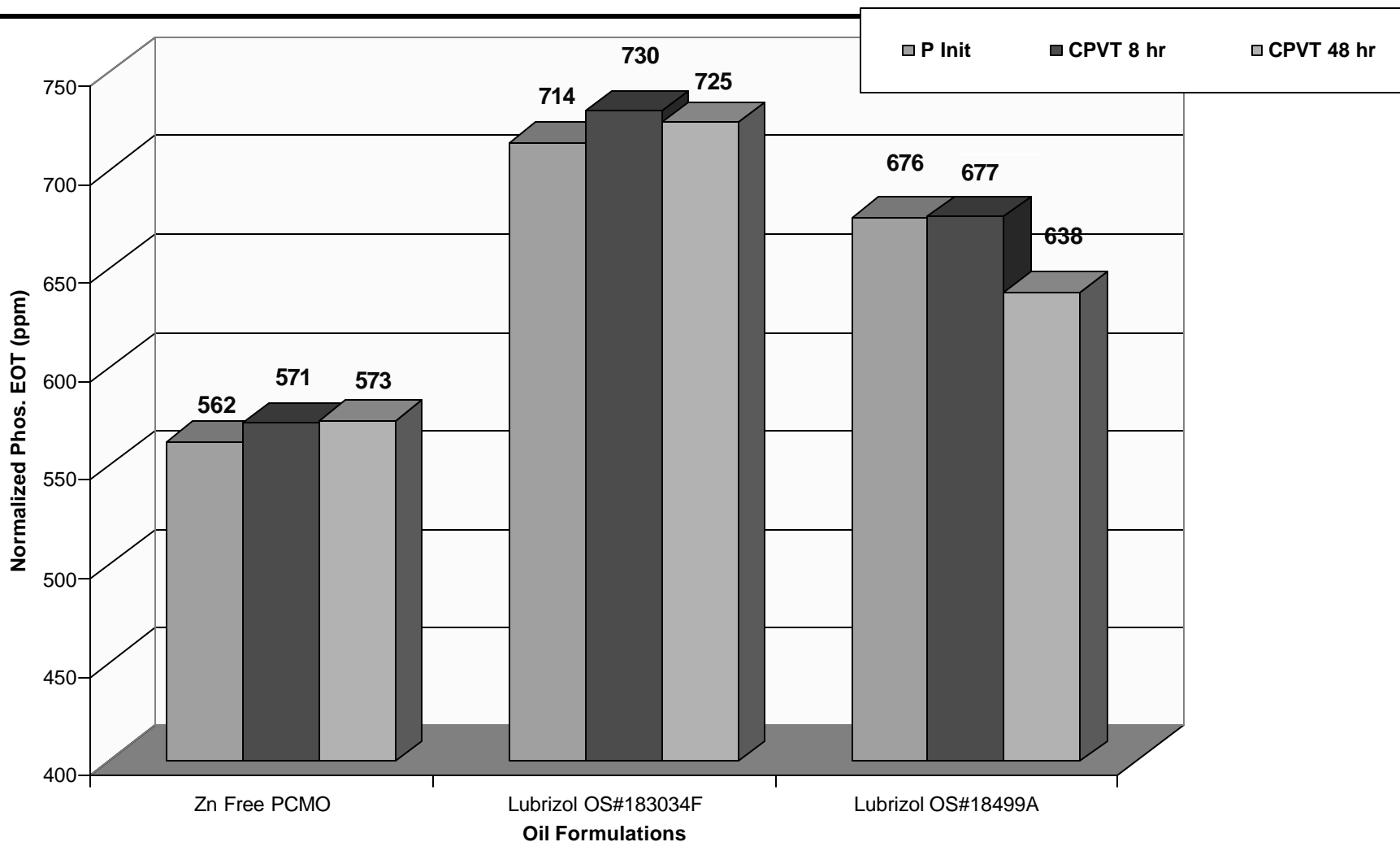
Phosphorus Volatility in Ciba Phos. Volatilization Test (CPVT)



Exposure to 8 hr CPVT is not sufficient to discriminate Phos. Volatility



Phosphorus Volatility in Ciba Phos. Volatilization Test (CPVT)



Time dependence is critical



Summary:

- CPVT correlates properly with the Phos Volatility of all oils ran with field test results.
- The repeatability and precision of CPVT appear to be acceptable but more statistical data analysis required.
- Differentiation between the Phos Volatility should probably be improved with future work: (Temperature dependence)

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