

AP*TECH

APPLIED PHYSICS TECHNOLOGIES

Refractory Metals, LaB₆/CeBixTM, and Carbides: Single Crystals, Cathodes, Thin-film Sources

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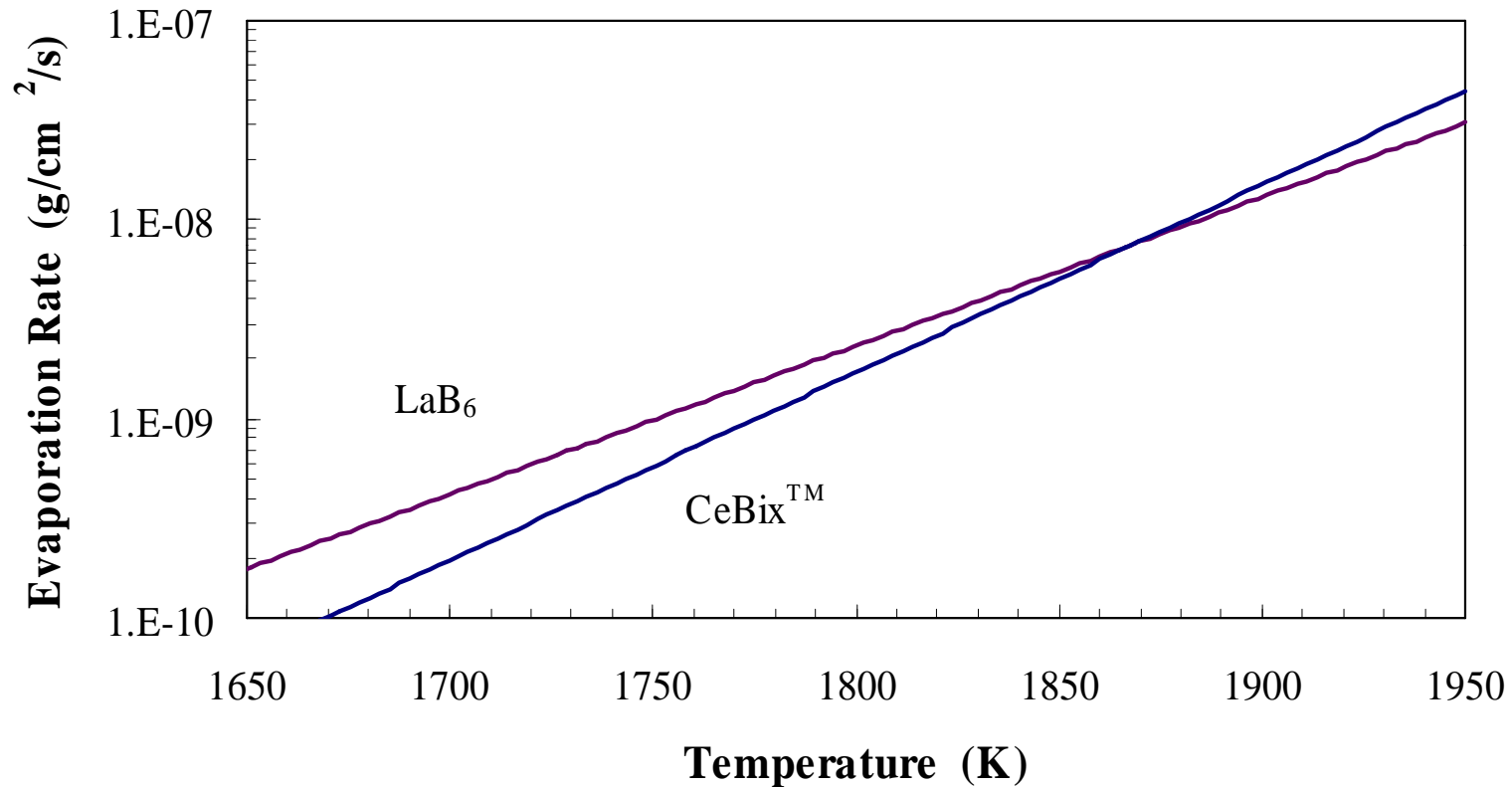
LaB₆ and CeBixTM Data;

Comparative Advantages of CeBixTM

CeBix™ Advantages

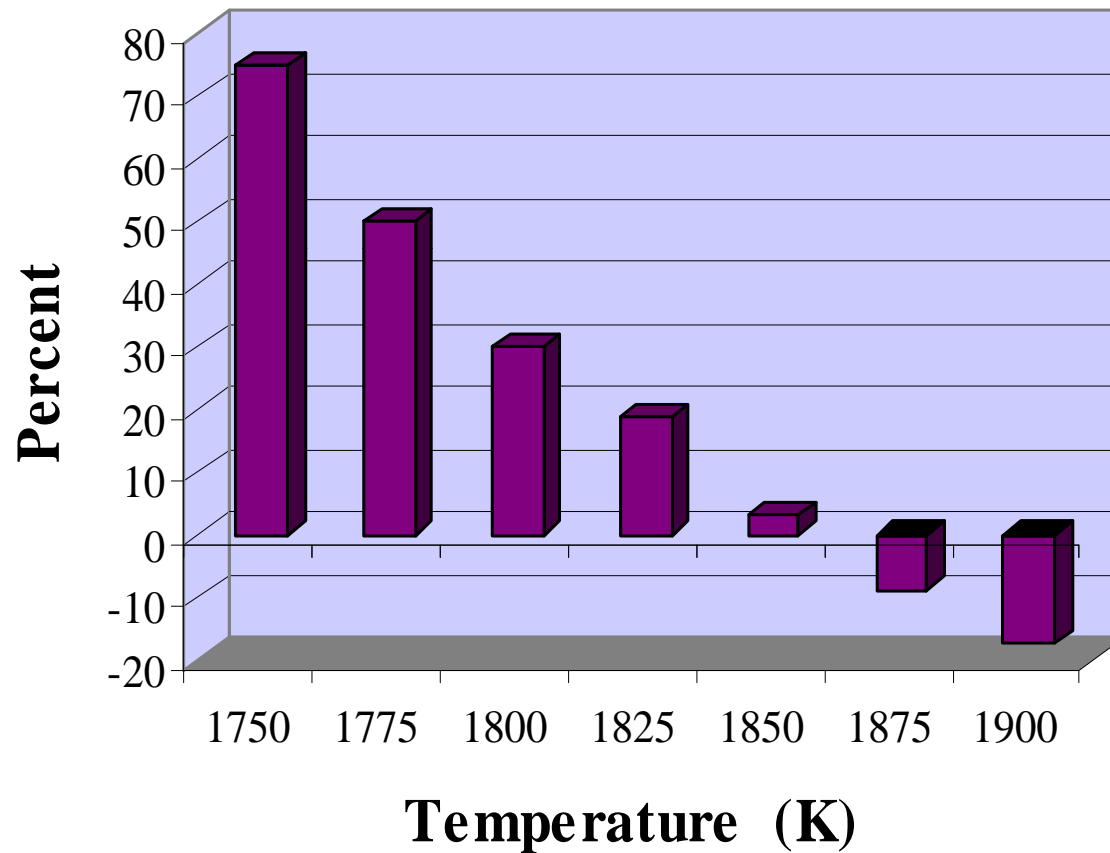
- Increased Lifetime
 - Lifetimes of up to 5,000 hours reported
- Lower volatility
 - Less Wehnelt contamination
 - Lower rate of change of cutoff potential

Evaporation Rate Comparison for LaB₆ and CeBix™ at 2 x 10⁻⁸ Torr



Source: P.R. Davis, et.al., Oregon Graduate Institute

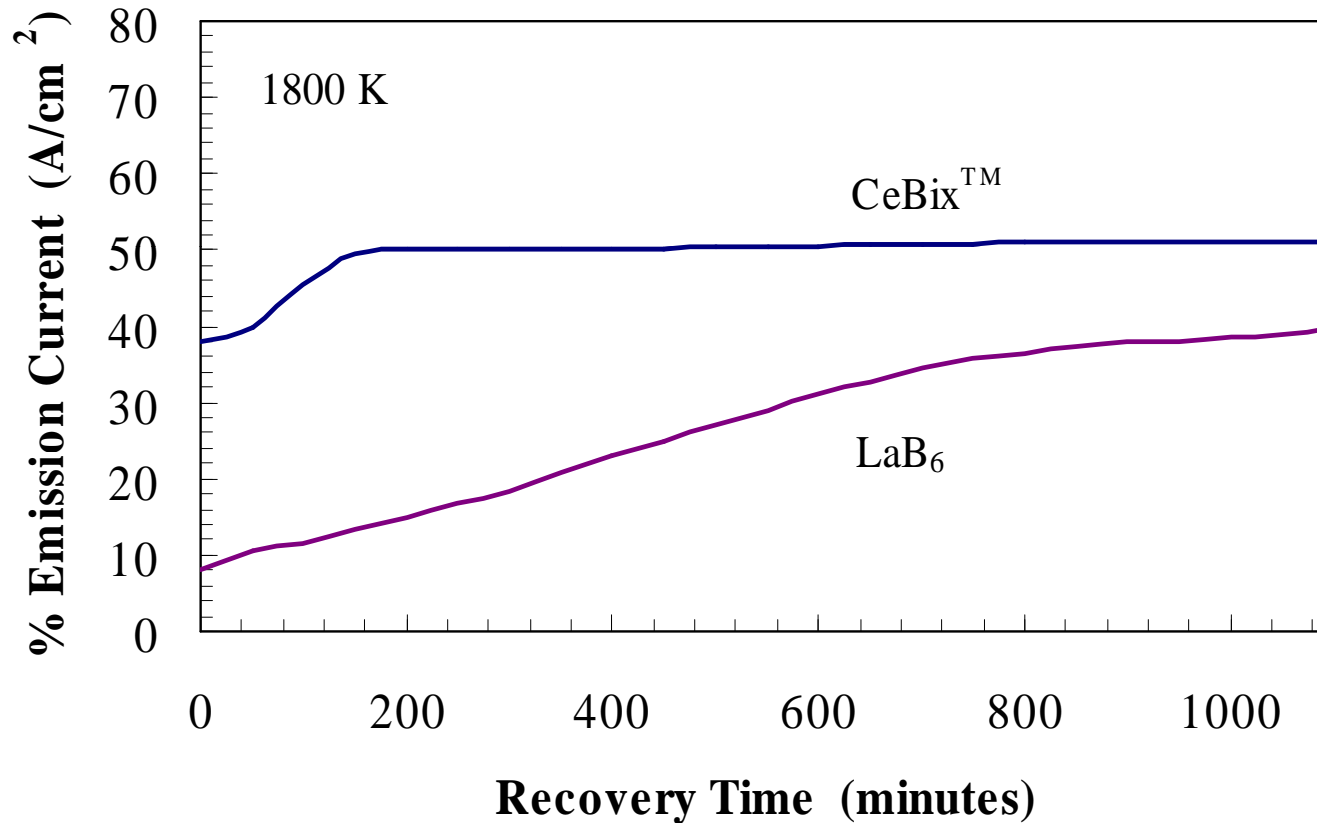
Percent Difference between LaB_6 and CeBix^{TM} Evaporation Rates



CeBix™ Advantages

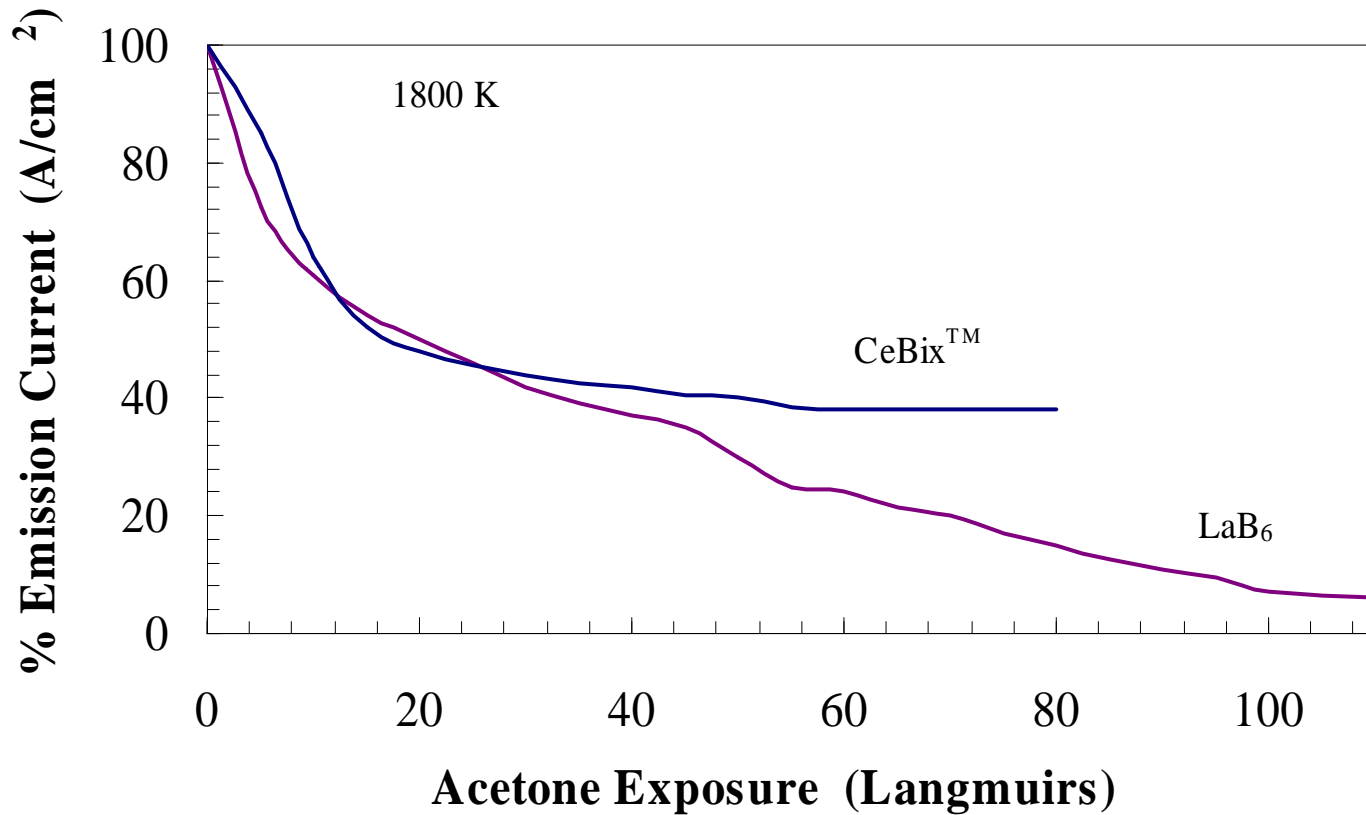
- Increased Stability
 - Less time to reach stable operation
 - More rapid recovery from contamination events
- Less total current required at optimum brightness

Recovery from Carbon Contamination Comparison between LaB₆ and CeBix™



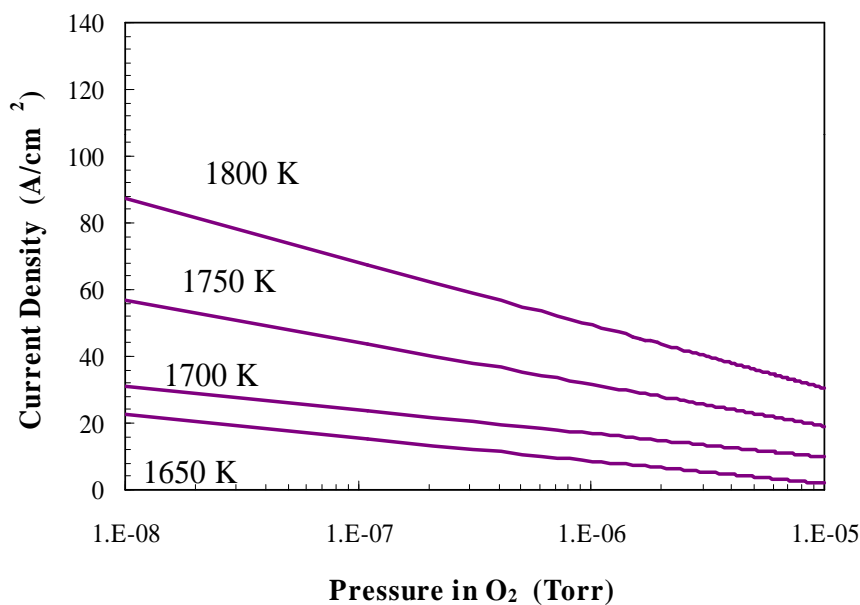
Carbon Contamination

Comparison between LaB₆ and CeBix™

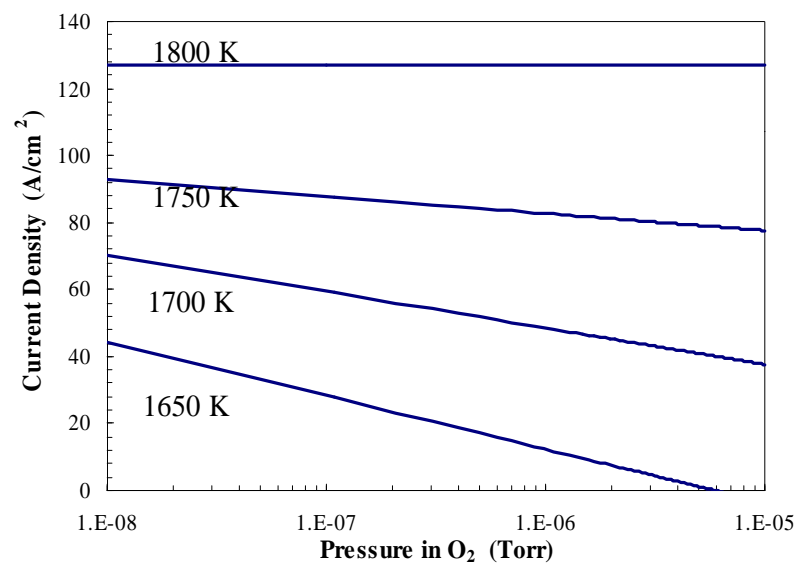


Oxygen Contamination Comparison between LaB₆ and CeBix™

LaB₆



CeBix™



Summary

Comparison of LaB₆ and CeBix™

- CeBix™ exhibits a lower evaporation rate
- CeBix™ is more resistant to carbon contamination
- Reduced effects of O₂ on CeBix™
- CeBix™ stabilizes faster after air exposure
- CeBix™ has a lower work function
- CeBix™ requires much lower total current at the same bias setting and at the optimum filament setting
- CeBix™ operates at a lower temperature at the optimum filament setting
- CeBix™ is a direct replacement for LaB₆