Graphite and C-C materials for UHV applications

D. LE NGOC, J-P. BOJON

Presented by J.M. JIMENEZ

AT/VAC/SL Section

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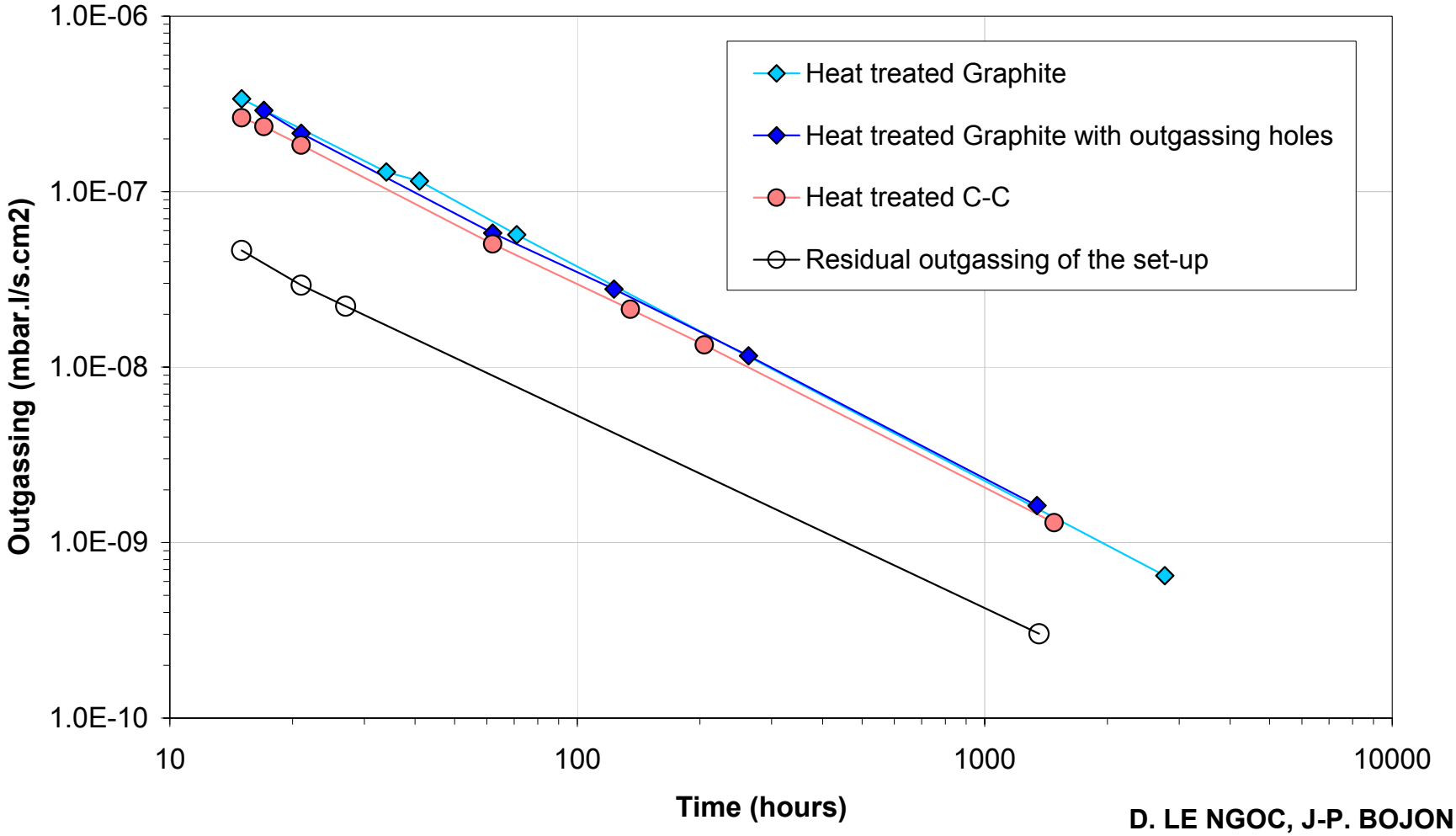
Static Outgassing before bakeout



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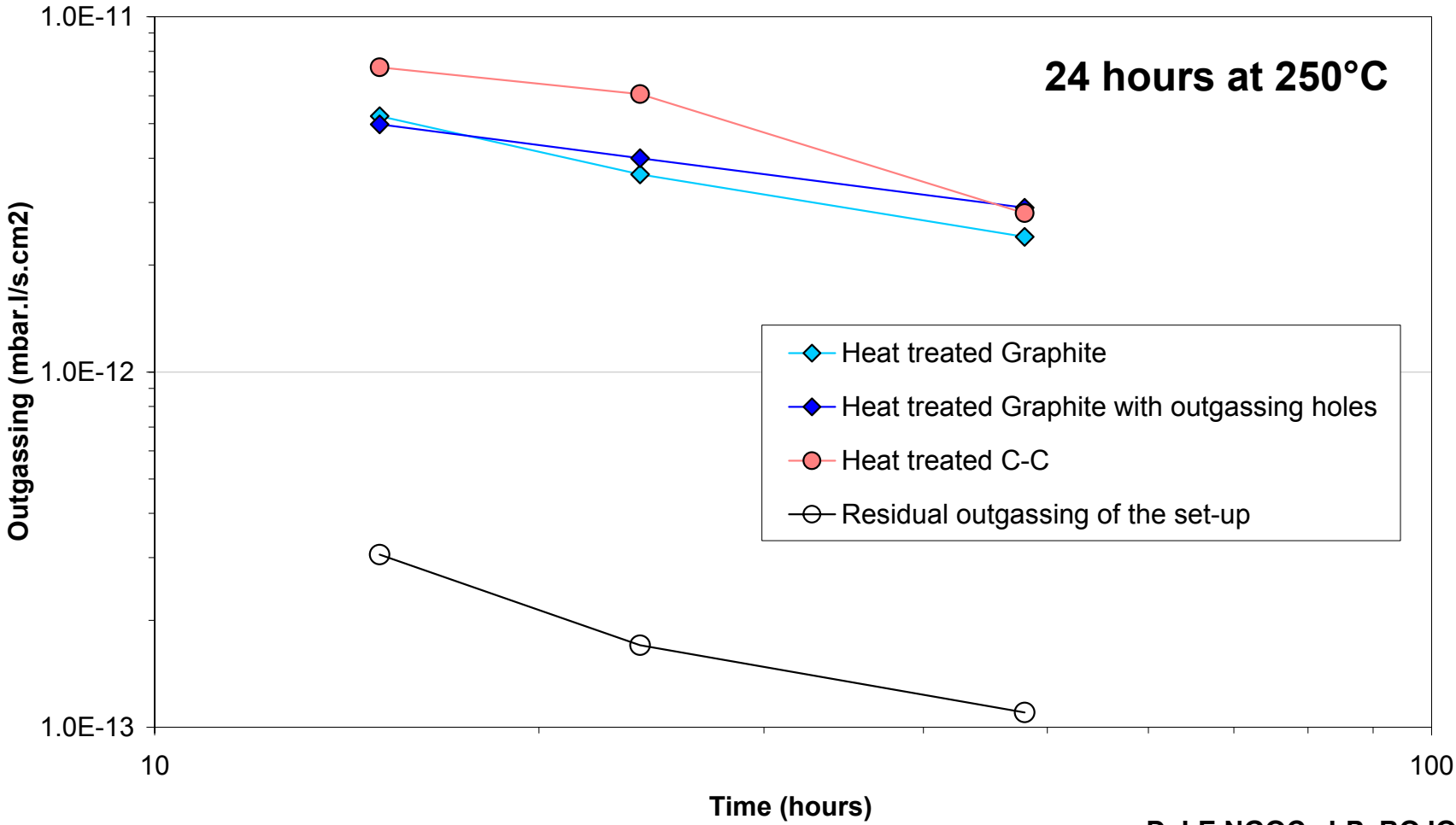

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Outgassing stimulated by e^- bombardment

Sample: 14 cm^2
Heating power: 175 W (2.5 keV, 70 mA)
Bombardment duration: 3 min.
Temperature reached: 1050°C
Effective pumping speed: 40 l/s

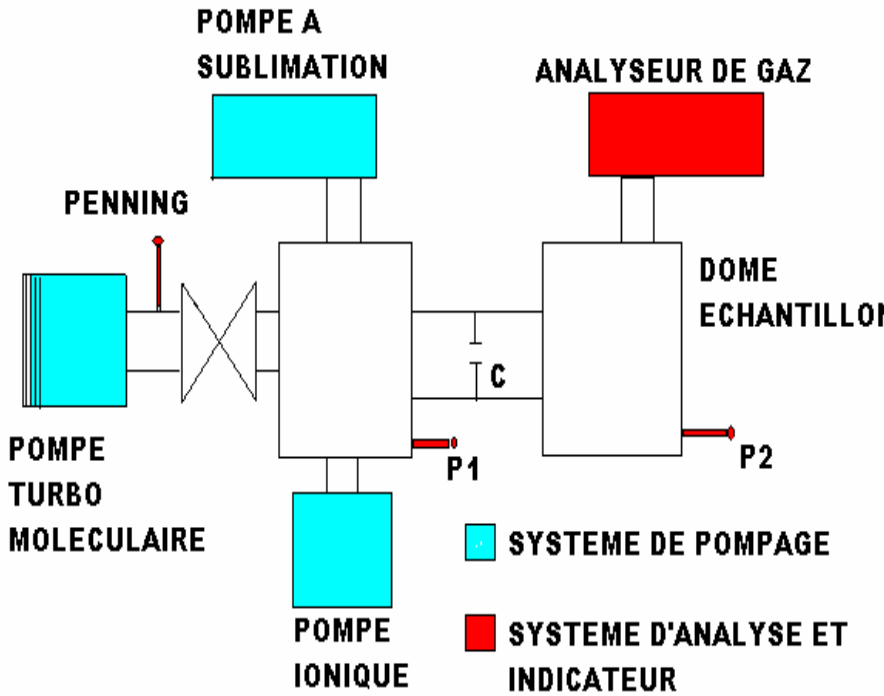
- **Pressure rise by 4 orders of magnitude**

Gas analysis after 1 hour

	At 1050°C	After 1 h RT
H_2O		30 %
H_2	30 %	23 %
CH_4		15 %
CO	40 %	12 %

- **Higher ionization cross section for CH_4 and CO**

Schematic view of the set-up



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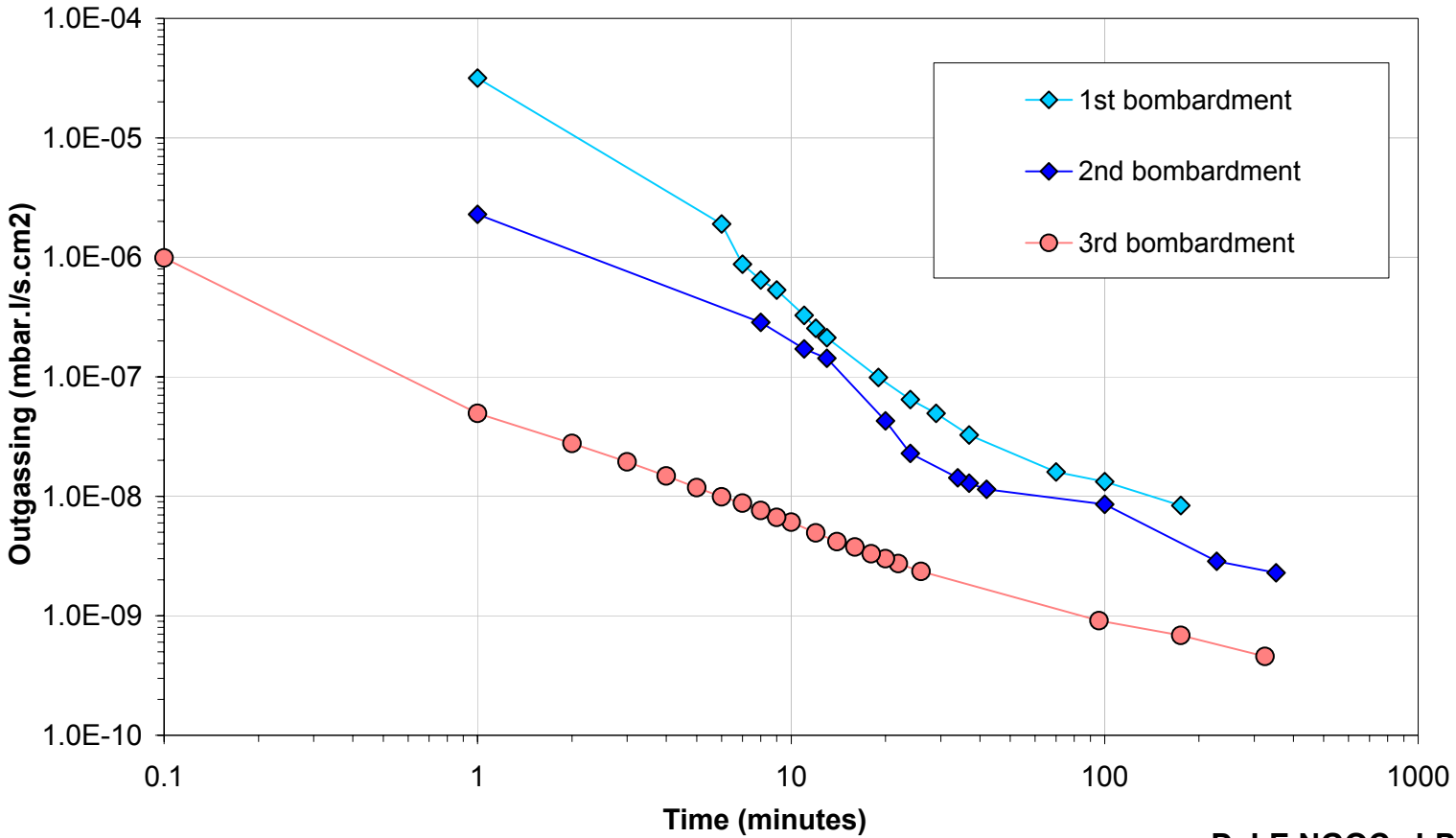
Outgassing stimulated by e^- bombardment

Outgassing recovery after heating

Case of the Graphite



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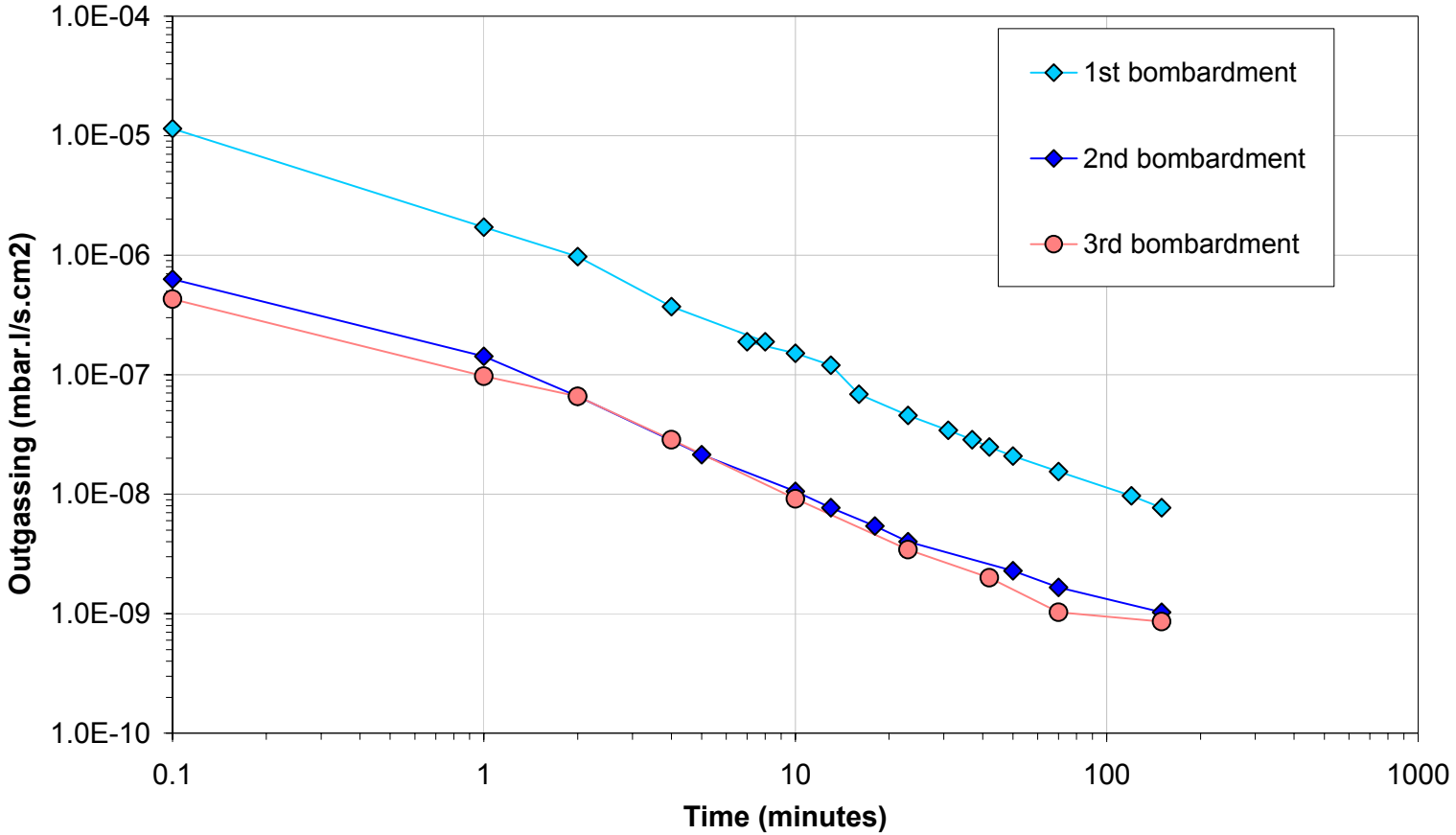
Case of the C-C



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CONCLUSIONS

- **Heat treatment under vacuum at 1000°C during 2 h**
  - Absolutely required, gain: 2 orders of magnitude
- **Static outgassing rate**
  - Before bake-out: 5.0×10^{-10} mbar.l/s.cm^2
  - After bake-out: 3.0×10^{-12} mbar.l/s.cm^2
  - Acceptable for the LHC after bake-out
- **Gas composition at 1050°C**
  - CH_4 and CO are a problem ⇨ high ionisation cross section
- **Recovery after heating**
  - 4 orders of magnitude increase at 1050 °C
  - 3 orders of magnitude recovery after 1h½
  - Compatible with the refilling of the LHC

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