

Strong-Base Activated Carbons Derived from Recycled CDs and DVDs for Sustainable BTX Removal

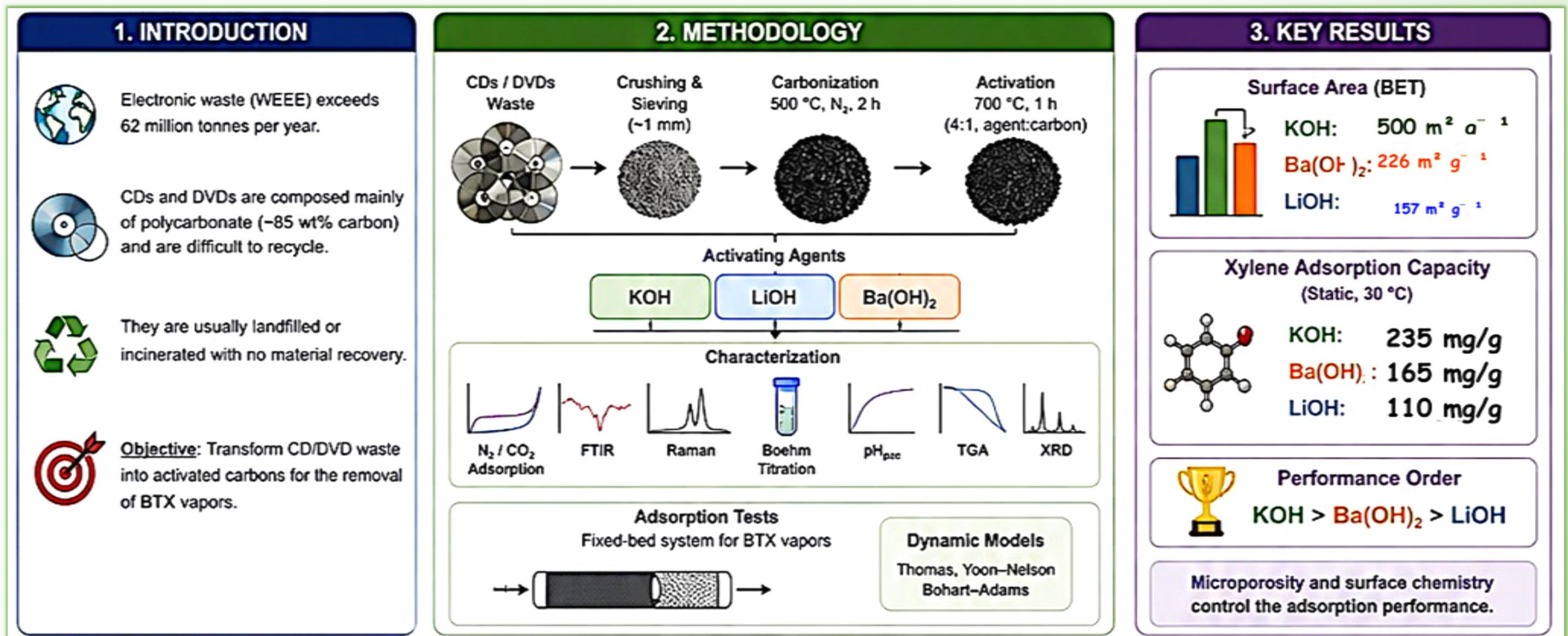


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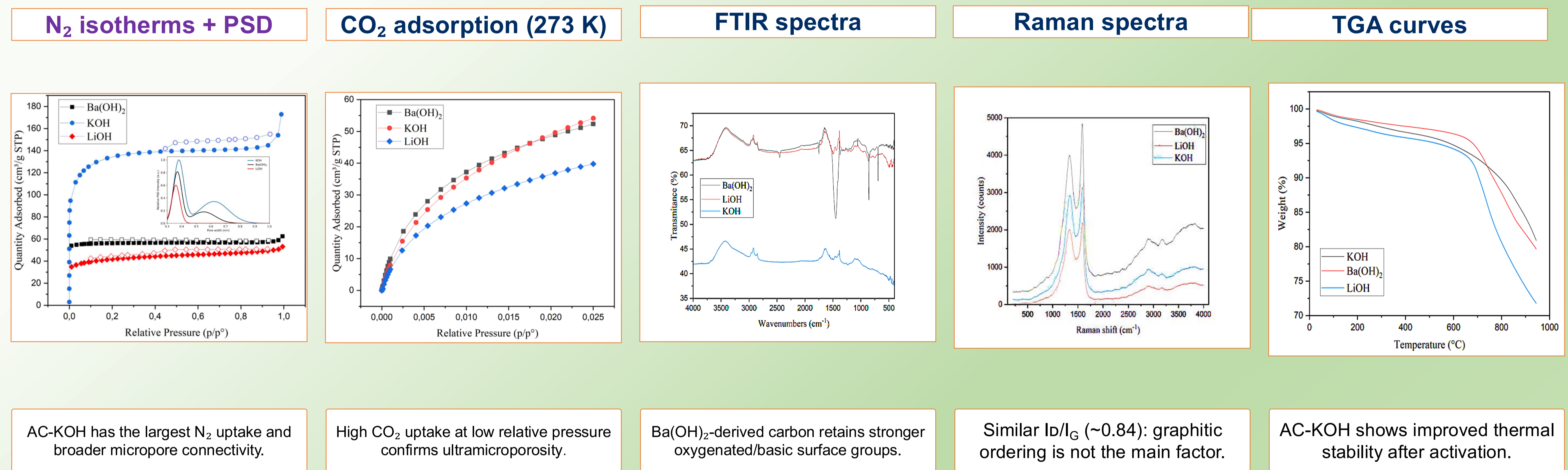
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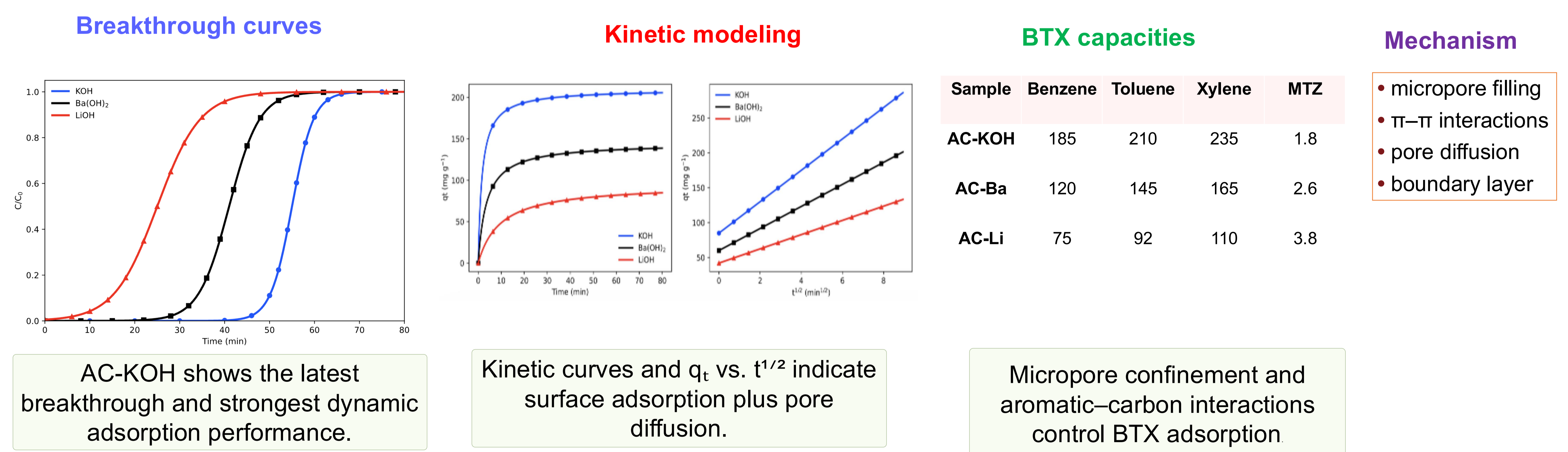
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4. RESULTS AND DISCUSSION



5. ADSORPTION PERFORMANCE (BTX VAPORS)



6. CONCLUSIONS

- CDs and DVDs can be successfully transformed into high-performance activated carbons.
- KOH activation at 700 °C with a 4:1 agent-to-carbon ratio produces the best material (≈ 500 m² g⁻¹; 235 mg g⁻¹ for xylene).
- Microporosity and surface chemistry govern BTX adsorption, not the graphitic ordering.
- Adsorption follows pseudo-second-order kinetics and is well described by the Thomas model in fixed-bed column.
- This work provides a new valorization route for electronic polymer waste within a circular economy framework.

7. IMPACT

- Environmental Impact**
- Reduces electronic waste in landfills
 - Low-cost adsorbent for VOC removal
 - Supports sustainable wastewater treatment
- Scientific Impact**
- First systematic study of CD/DVD waste as precursor
 - Structure-property relationships clarified for polycarbonate derived carbons
 - Valuable insights for designing adsorbents from polymeric waste

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