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In the crystal structure of the title compound, \( \text{C}_{20}\text{H}_{38}\text{N}_{2}^{2+} \cdot \cdot \cdot 2\text{Br}^{-} \), the centroid of the aromatic ring is located on an inversion center, so that the asymmetric unit consists of one-half molecule of the dication and one bromide anion. C—H···Br interactions connect the two components into a three-dimensional network. An intramolecular C—H···π interaction is also observed.

Related literature
For the properties of dicationic ionic liquids, see: Anderson et al. (2005). For the structure of p-phenylenedimethanaminium dibromide, see: Zhang & Han (2010).

Experimental

Crystal data
\( \text{C}_{20}\text{H}_{38}\text{N}_{2}^{2+} \cdot \cdot \cdot 2\text{Br}^{-} \) \( M_{r} = 466.34 \)

Monoclinic, \( P2_{1}/n \)
\( a = 8.2713 (5) \, \AA \)
\( b = 14.1440 (9) \, \AA \)
\( c = 9.0762 (6) \, \AA \)
\( \beta = 97.634 (1)^{\circ} \)
\( V = 1052.41 (12) \, \AA^{3} \)

\( Z = 2 \)
Mo Kα radiation
\( \mu = 3.86 \, \text{mm}^{-1} \)
\( T = 100 \, \text{K} \)
\( 0.51 \times 0.47 \times 0.35 \, \text{mm} \)

Data collection
Bruker APEX2 CCD diffractometer
10066 measured reflections
2304 independent reflections
112 parameters
H-atoms constrained
\( \Delta \rho_{\text{max}} = 0.43 \, \text{e} \, \text{Å}^{-3} \)
\( \Delta \rho_{\text{min}} = -0.23 \, \text{e} \, \text{Å}^{-3} \)

Refinement
\( R(F^2) = 0.043 \)
\( \delta = 1.06 \)
2304 reflections

Table 1
Hydrogen-bond geometry (Å, °).

<table>
<thead>
<tr>
<th>D—H···A</th>
<th>D—H</th>
<th>H···A</th>
<th>D···A</th>
<th>D—H···A</th>
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</thead>
<tbody>
<tr>
<td>C7—H7A···Br1</td>
<td>0.99</td>
<td>2.80</td>
<td>3.7565 (14)</td>
<td>163</td>
</tr>
<tr>
<td>C2—H2B···Br1†</td>
<td>0.99</td>
<td>2.90</td>
<td>3.7716 (14)</td>
<td>148</td>
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<td>C6—H6B···Br1†</td>
<td>0.99</td>
<td>2.92</td>
<td>3.8318 (14)</td>
<td>153</td>
</tr>
<tr>
<td>C7—H7B···Br1†</td>
<td>0.99</td>
<td>2.89</td>
<td>3.7832 (14)</td>
<td>150</td>
</tr>
<tr>
<td>C1—H1C···Cg</td>
<td>0.98</td>
<td>2.74</td>
<td>3.6529 (16)</td>
<td>156</td>
</tr>
</tbody>
</table>

Symmetry codes: (i) \( x, y, z + 1 \); (ii) \( x - \frac{1}{2}, -y + \frac{1}{2}, z + \frac{1}{2} \).

Data collection: APEX2 (Bruker, 2007); cell refinement: SAINT (Bruker, 2007); data reduction: SAINT; program(s) used to solve structure: SHELXS97 (Sheldrick, 1996); program(s) used to refine structure: SHELXL97 (Sheldrick, 2008); molecular graphics: X-SEED (Barbour, 2001); software used to prepare material for publication: SHELXL97 and pubCIF (Westrip, 2010).

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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: IS5042).

References