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# Di-$\mu$-bromo-bis[(methyl isocyanide-$\kappa C$)-(triphenylphosphine-$\kappa P$)silver(I)]

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**Key indicators**

Single-crystal X-ray study
$T$ = 140 K
Mean $\sigma$(C–C) = 0.006 Å
$R$ factor = 0.043
$wR$ factor = 0.114
Data-to-parameter ratio = 25.6

For details of how these key indicators were automatically derived from the article, see http://journals.iucr.org/e.

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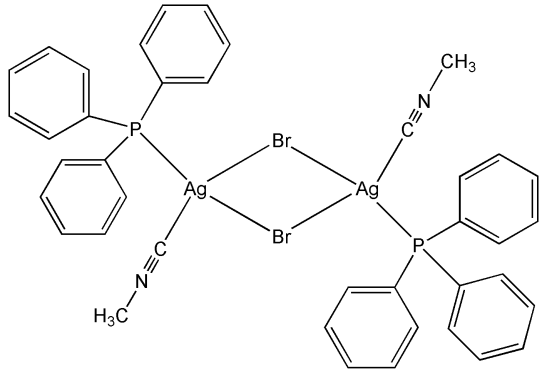
The dimeric title molecule, $[Ag_2Br_2(C_2H_3N)_2(C_{18}H_{15}P)_2]$, has crystallographic inversion symmetry. The two bridging Ag—Br lengths are similar, at 2.7301 (6) and 2.7284 (7) Å.

## Comment

The title complex, (I), has a center of symmetry, distorted tetrahedral geometry about the Ag atom, and mid-range Ag—P and Ag—C distances. However, the bridging Ag—Br distances are more nearly equal than those seen in two other dimeric complexes with bis-triphenylphosphine ligand sets, *viz*. 2.701 (8)/2.733 (9) Å (Gotsis *et al.*, 1989) and 2.7350 (6)/2.8241 (5) Å (Cox *et al.*, 2000). The distance between the bridged Ag atoms is 3.5486 (8) Å.




(I)

## Experimental

The title compound crystallized directly from the reaction mixture of $[AgBr(PPh_3)]_4$ and four equivalents of methyl isocyanide in methanol.

*Crystal data*

$[Ag_2Br_2(C_2H_3N)_2(C_{18}H_{15}P)_2]$
$M_r$ = 982.21
Triclinic, $P\overline{1}$
$a$ = 8.3490 (17) Å
$b$ = 9.2120 (15) Å
$c$ = 13.8990 (15) Å
$\alpha$ = 83.301 (11)°
$\beta$ = 79.651 (13)°
$\gamma$ = 65.499 (14)°
$V$ = 955.8 (3) Å$^3$
$Z$ = 1
$D_x$ = 1.706 Mg m$^{-3}$
Mo $K\alpha$ radiation
Cell parameters from 30 reflections
$\theta$ = 6.4–21.9°
$\mu$ = 3.23 mm$^{-1}$
$T$ = 140 (2) K
Block, colorless
0.40 × 0.24 × 0.15 mm

*Data collection*

Siemens $R3$ diffractometer
$\omega$ scans
refined from $\Delta F$ (*XABS2*; Parkin *et al.*, 1995)
$T_{min}$ = 0.433, $T_{max}$ = 0.619
5582 measured reflections
5582 independent reflections
4498 reflections with $I > 2\sigma(I)$
$\theta_{max}$ = 30.0°
$h = -11 \rightarrow 11$
$k = -12 \rightarrow 12$
$l = 0 \rightarrow 19$
2 standard reflections
every 198 reflections
intensity decay: <0.1%

*Refinement*

| | |
|---|---|
| Refinement on $F^2$ | $w = 1/[\sigma^2(F_o^2) + (0.0565P)^2 + 2.5564P]$ where $P = (F_o^2 + 2F_c^2)/3$ |
| $R[F^2 > 2\sigma(F^2)] = 0.043$ | $(\Delta/\sigma)_{max} = 0.001$ |
| $wR(F^2) = 0.114$ | $\Delta\rho_{max} = 1.30$ e Å$^{-3}$ |
| $S = 1.04$ | $\Delta\rho_{min} = -1.58$ e Å$^{-3}$ |
| 5582 reflections | |
| 218 parameters | |
| H-atom parameters constrained | |

**Table 1**
Selected geometric parameters (Å, °).

| | | | |
|---|---|---|---|
| Ag1—C19 | 2.196 (4) | Ag1—Br1 | 2.7301 (6) |
| Ag1—P1 | 2.4532 (10) | N1—C19 | 1.142 (5) |
| Ag1—Br1$^{i}$ | 2.7284 (7) | N1—C20 | 1.437 (5) |
| | | | |
| C19—Ag1—P1 | 118.09 (12) | P1—Ag1—Br1 | 111.96 (3) |
| C19—Ag1—Br1$^{i}$ | 104.14 (11) | Br1$^{i}$—Ag1—Br1 | 98.899 (19) |
| P1—Ag1—Br1$^{i}$ | 112.20 (3) | Ag1$^{i}$—Br1—Ag1 | 81.102 (19) |
| C19—Ag1—Br1 | 109.61 (12) | | |

Symmetry code: (i) $1-x, 2-y, 1-z$.

H atoms were treated as riding, with C—H distances of 0.95 Å and $U_{iso}(H) = 1.5U_{eq}(C)$. The maximum and minimum electron-density peaks are located 1.44 Å from Ag1 and 0.54 Å from Br1, respectively

Data collection: *P3-PC* (Siemens, 1991); cell refinement: *P3-PC*; data reduction: *XDISK* (Siemens, 1991); program(s) used to solve structure: *SHELXS*97 (Sheldrick, 1997); program(s) used to refine structure: *SHELXL*97 (Sheldrick, 1997); molecular graphics: *XP* in *SHELXTL* (Sheldrick, 1994); software used to prepare material for publication: *SHELXL*97.

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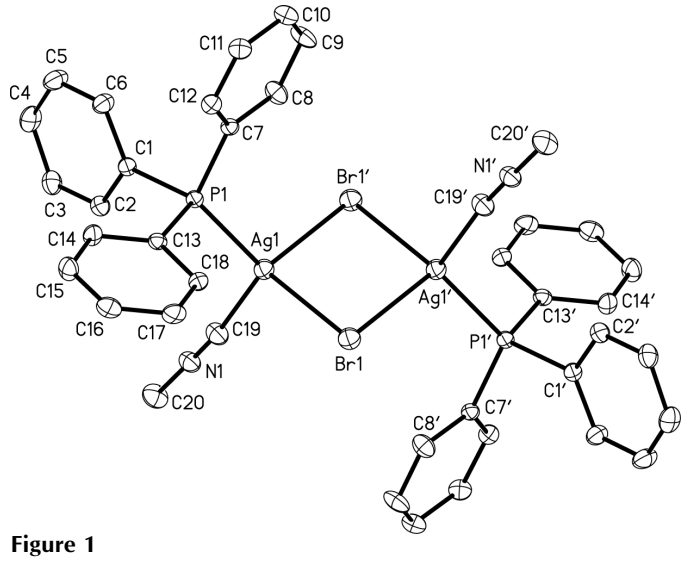


**Figure 1**
A view of (I). Displacement ellipsoids are drawn at the 50% probability level. H atoms have been omitted. Primed atom labels correspond to symmetry code (i) in Table 1.

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