C–H Arylation with Platinum

**Significance:** C–H activation in aryl systems finds broad applicability in the construction of conjugated organic materials. This paper reports the use of a platinum catalyst to couple aryl groups pendant on hypervalent iodine to simple arenes via a C–H activation pathway.

**Comment:** The authors have previously reported a similar process using a palladium catalyst (ACS Catal. 2011, 1, 170). However, with the exception of some examples in which the reaction resulted in mixed isomers, the use of a platinum catalyst produced materials with different selectivity than the palladium catalyst, providing two processes with complementary reactivity.

**Selected examples:**

\[
\begin{align*}
\text{MeO} & \quad \text{Ph} & 83\% \text{ yield} \\
\text{MeO} & \quad \text{Ph} & 48\% \text{ yield} \\
\text{Ph} & \quad \text{F} & 52\% \text{ yield, } m/p = 6:1 \\
\text{Cl} & \quad \text{p-MeOC}_6\text{H}_4 & 53\% \text{ yield, } m/p = 1.4:1 \\
\text{Cl} & \quad \text{Br} & 58\% \text{ yield, } m/p = 2.5:1
\end{align*}
\]

**Proposed mechanism:**

\[
\begin{align*}
\text{[Cl}_4\text{Pt}^0\text{Ar}^2+] & \xrightarrow{[\text{Ar}_2]^X} \text{[Cl}_4\text{XPt}^{IV}\text{Ar}^2+] \\
\text{[Cl}_4\text{XPt}^{IV}\text{Ar}^2+] & \xrightarrow{HX} \text{ArI} \\
\text{ArI} & \xrightarrow{[\text{Ar}_2]^X} \text{[Cl}_4\text{Pt}^0\text{Ar}^2+]
\end{align*}
\]