Construction of a Tetrafluoroethylene-Bridging Structure via Carbocupration

1. [CuO-Bu] (1.0 equiv) Phen (1.0 equiv) THF, 40 °C, 24 h
2. TFE (excess) Ar1-B Ar2

Selected examples:

- PhCF3
  - Yield: 97%
- PhCHO
  - Yield: 99%
- PhNH2
  - Yield: 95%
- PhPy
  - Yield: 97%
- PhH2-4-CF3
  - Yield: 92%
- PhH2-4-CF3
  - Yield: 90%
- PhMe2N
  - Yield: 90%
- PhH2-4-CF3
  - Yield: 94%
- PhH2-4-CF3
  - Yield: 96%

Synthesis of a liquid-crystalline compound:

H11C5 O OH

64% yield over 6 steps

Significance: The authors report the synthesis, characterization, and synthetic application of 2-aryl-1,1,2,2-tetrafluoroethylcopper complexes. Starting with a carbocupration of tetrafluoroethylene (TFE), a variety of 1,2-difunctionalized 1,1,2,2-tetrafluoroethanes were prepared in high yields.

Comment: The molecular structure of the aryl-TFE-copper species was determined by X-ray crystallography and NMR analysis. Furthermore, the synthetic utility for liquid-crystalline compounds bearing a tetrafluoroethylene-bridging structure was demonstrated.