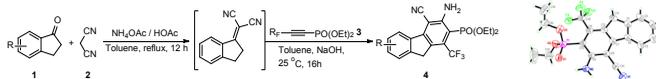


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An Efficient Process for the Synthesis of Fluorine and Phosphorus Containing Fluorenes

Fluorene derivatives have attracted wide spread interest because of their important applications in the fields of biomedical and photoelectric materials. Moreover, they are also effective ligands in organometallic chemistry and unique protecting groups in peptide synthesis. In recent years, the photoelectrical potential of fluorene and related derivatives has become well recognized. Herein we report a novel and efficient metal-free method for the synthesis of perfluoroalkylated fluorenylphosphonate derivatives **4** involving the reaction of 1-indanones **1**, malononitrile **2** and perfluoroalkynyl phosphonates **3** (Scheme 1). A series of perfluoroalkylated fluorenylphosphonate derivatives **4** were synthesized in moderate to good yields (Table 1).



Scheme 1

Fig. 1. X-ray diffraction of **4**^a

Table 1 Synthesis of perfluoroalkylated fluorenylphosphonate derivatives **4**^a

Entry	R	RF	4	Yield (%) ^b
1	H	CF ₃	4a	82
2	4-Br	CF ₃	4c	49
3	4-Me	CF ₃	4d	74
4	6-Me	CF ₃	4e	75
5	5-Me	CF ₃	4f	70
6	H	C ₂ F ₅	4g	74
7	5-Me	n-C ₃ F ₇	4h	51

^a Reaction conditions: indenones **1** (1.0 mmol), malononitrile **2** (1.0 mmol), AcOH (0.1 equiv.) and NH₄OAc (0.2 equiv.) were stirred in refluxing toluene (5 mL). After 12 h, NaOH (1.5 equiv.) and perfluoroalkynyl phosphonates **3** (1.3 equiv.) were added and the mixture was stirred in Toluene for another 16 h at 25°C. ^b Isolated yields

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Biography

Xiaoli Sun is 24 years old and currently enrolled in the Chemistry Department of Shanghai University as a MS student majoring in organic chemistry under the guidance of Professor Weiguo Cao. The group is committed to the synthesis of a series of perfluoroalkylated compounds.

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