Supporting Information

Highly Selective Electrochemical Fluorination of Organosulfur Compounds in Et$_3$N·3HF Ionic Liquid Under Ultrasonication

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Experimental Section

General Information

$^1$H NMR (270 MHz) and $^{19}$F NMR (254 MHz) spectra were determined using CDCl$_3$ as a solvent. The chemical shift for $^{19}$F NMR is given in $\delta$ (ppm) upfield from the peak for external trifluoroacetic acid. The product yields were determined by $^{19}$F NMR using monofluorobenzene as an internal standard material. Voltammetry measurements were performed using HOKUTODENKO HABF501. Preparative electrolysis experiments were carried out with Metronix Corp. (Tokyo) constant current power supply model 5944 by monitoring electricity with HOKUTODENKO Coulomb/Amoperehour meter HF-201. Gas chromatography was carried
out with SHIMADZU GC-8A. Ultrasonication was conducted with HONDA ELECTRONICS Ultrasonic Multi Cleaner W115 for anodic fluorination of 1 and IWAKI GLASS ULTRASONIC CLEANER USC100Z 38s-22 for anodic fluorination of 4.

**Materials**

Et$_3$N·3HF was obtained from Morita Chemical Co. Ltd. (Japan). It is toxic and may cause a serious burn if it comes in contact with unprotected skin. However, proper safety precautions should be taken at all times. It is therefore recommended that rubber gloves should be used. Ethyl α-phenylthioacetate (1) and 2-phenyl-3-methyl-4-thiazolidinone (4) were purchased and used without purification. The known fluorinated products (2, 3, 5) were identified by comparison with the spectral data of their authentic samples.$^{1,2}$

**A typical procedure for anodic fluorination**

Constant current anodic fluorination of 1 and 4 (1 mmol) was carried out with platinum electrodes (1 x 1 cm$^2$) in Et$_3$N·3HF (3 mL) in an undivided cell at 24 ± 2 °C. After electrolysis, the yields of the products were estimated by $^{19}$F NMR using monofluorobenzene as an internal standard. After the electrolyte was mixed with 10 ml of water, the product was extracted with ether and dried over anhydrous Na$_2$SO$_4$. Then, the extracts were evaporated and almost pure products 2, 3 and 5 were obtained.
Figure S1. Sonoelectrochemical Reaction System

References
