

## PHENYLSELENOFLUORINATION OF ALKYNES

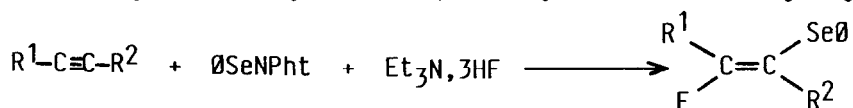
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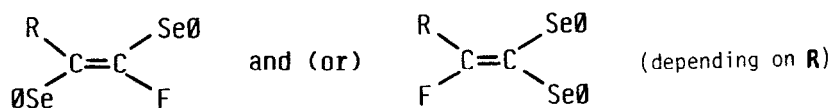
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Alkynes undergo phenylselenofluorination using N-phenylselenophthalimide (NPSP) and triethylamine trihydrofluoride, a weakly acidic fluorinating reagent [1].



This formal addition of " $\phi SeF$ " is assumed to be "anti" following mainly Markovnikov's rule. With  $R^1$  and  $R^2 \neq H$ , only one addition is observed, whereas, in the case of  $R^1$  or  $R^2 = H$ , a second addition takes place with subsequent elimination of HF leading to diselenated products :



It should be observed that N-phenylthiophthalimide does not react under the same conditions.

For such phenylselenofluorination, NPSP activation with strong acid [2] is not required allowing this reaction to be used with acido-sensitive alkynes. Some of these phenylselenofluorinated compounds lead to vinyl fluorides through reduction ( $\phi_3SnH/AIBN$ ) and to fluoroallenes (Se oxidation followed by cis thermal elimination).

- 1 G. Alvernhe, A. Laurent and G. Haufe, *Synthesis*, 562 (1987) ;  
G. Haufe, G. Alvernhe, D. Anker, A. Laurent and C. Saluzzo, *Tetrahedron Letters*, **29**, 2311 (1988) ;  
D. Picq, D. Anker, C. Rousset and A. Laurent, *Tetrahedron Letters*, **24**, 5619 (1983).
- 2 K.C. Nicolaou, N.A. Petasis and D.A. Claremont, *Tetrahedron*, **41**, 4835 (1985).