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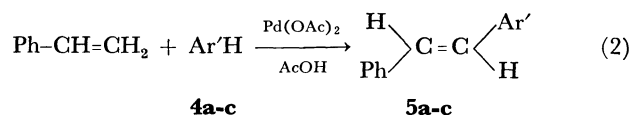


TABLE 2. REACTION OF STYRENE WITH ALKYL BENZENES

Ar'H		Products and Yield % <sup>b)</sup>
Toluene	<b>4a</b> <sup>a)</sup>	<b>5a</b> , 61
<i>p</i> -Xylene	<b>4b</b> <sup>a)</sup>	<b>5b</b> , 47
Mesitylene	<b>4c</b>	<b>5c</b> , 9 (0.5) <sup>c)</sup>

a) Ref. 1. b) based on Pd(OAc)<sub>2</sub> used. c) 1-Phenyl-1-mesitylethylene **3c** formed.

The results suggest that there is a greater steric hindrance at the site of the arylating species in the transition state involving a palladium-carbon  $\sigma$  bond.<sup>3)</sup>

### Experimental

The IR and UV spectra were measured with Hitachi EPI-S2 and Hitachi EPS-2U spectrophotometers, respectively. The NMR spectra were recorded on a JEOL Co. C-60HL spectrometer with TMS as an internal standard. Vpc analyses were carried out with a JEOL JGC-20K gas chromatograph.

Starting olefins **1b**, **1c**, and **1d** were prepared by known methods.<sup>4)</sup>

The arylation reactions were performed under normalized conditions: A mixed solution of olefin (50 mmol), palladium-(II) acetate (50 mmol), benzene (445 ml), and acetic acid (100 ml) was heated under reflux for 8 hr. After the usual work-up,<sup>1)</sup> the product mixture was subjected to vpc analysis, (SE-30, Microwax). Samples for spectral measurement and elemental analysis were collected by means of a preparative vpc. The spectral data of these products are summarized in Table 1. The compounds showed satisfactory elemental analyses.

### References

- 1) Y. Fujiwara, I. Moritani, S. Danno, R. Asano, and S. Teranishi, *J. Amer. Chem. Soc.*, **91**, 7166 (1969).
- 2) Compounds **3b** and **3c** were identified by comparison of authentic samples prepared by the reaction of acetophenone with corresponding arylmagnesium bromide followed by dehydration; L. I. Smith, "Organic Syntheses," Coll. Vol. II, p. 95 (1943); R. C. Fason, M. D. Armstrong, W. E. Wallace, and J. W. Kneisley, *J. Amer. Chem. Soc.*, **66**, 681 (1944).
- 3) S. Danno, I. Moriarty, and Y. Fujiwara, *Tetrahedron*, **25**, 4819 (1969).
- 4) C. G. Overberger and J. H. Saunders, "Organic Syntheses," Coll. Vol. III, p. 204 (1955); Hirschberg, *J. Amer. Chem. Soc.*, **71**, 3241 (1949); Eisenlahr and Schluz, *Ber.*, **57**, 1816 (1924).