



water (15 ml), and dried with magnesium sulfate. The solvent is evaporated and the crude product chromatographed on a silica-gel column (20 g/g; silica gel 60 Merck, for column chromatography, 70–230 mesh) using ether/pentane (20:80) as eluent. Product **4** is eluted first (except in the case of **4g** which is eluted together with **5**).

The general procedure is used for the synthesis of **4a, b, e, f**. In the synthesis of **4c, d, g**, HMPT (895 mg, 5 mmol) is added to the lithium diisopropylamide solution at  $-20^{\circ}$  prior to the addition of methyl dimethoxyacetate at  $-70^{\circ}$ . The general procedure is then followed except that at the end of the reaction the mixture is warmed to  $+10^{\circ}$  and held at this temperature for 60 min.

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<sup>1</sup> R. E. Damon, R. H. Schlessinger, *Tetrahedron Lett.* **1975**, 4551.

<sup>2</sup> G. Neef, U. Eder, *Tetrahedron Lett.* **1977**, 2825.

<sup>3</sup> C. G. Wermuth, H. Marx, *Bull. Soc. Chim. Fr.* **1964**, 732.

<sup>4</sup> R. W. Hoffmann, J. Schneider, *Chem. Ber.* **99**, 1899 (1966).

<sup>5</sup> B. M. Trost, G. S. Massiot, *J. Am. Chem. Soc.* **99**, 4405 (1977).

<sup>6</sup> F. Huet, M. Pellet, J. M. Conia, *Tetrahedron Lett.* **1976**, 3579.

<sup>7</sup> F. Huet, M. Pellet, J. M. Conia, *Tetrahedron Lett.* **1977**, 3505.

<sup>8</sup> F. Huet, A. Lechevallier, J. M. Conia, *Tetrahedron Lett.* **1977**, 2521.

<sup>9</sup> F. Huet, A. Lechevallier, M. Pellet, J. M. Conia, *Synthesis* **1978**, 63.

<sup>10</sup> E. L. Eliel, A. A. Hartmann, *J. Org. Chem.* **37**, 505 (1972).

<sup>11</sup> L. M. Lerner, *J. Org. Chem.* **41**, 2228 (1976).

<sup>12</sup> B. T. Gröbel, D. Seebach, *Synthesis* **1977**, 357.

<sup>13</sup> O. W. Lever, *Tetrahedron* **32**, 1943 (1976).

<sup>14</sup> J. W. Baker, *J. Chem. Soc.* **1942**, 520.

<sup>15</sup> L. N. Owen, *J. Chem. Soc.* **1945**, 385.

<sup>16</sup> H. Gross, J. Freiberg, *DDR Patent (East Germany)* 52360 (1966); *C. A.* **67**, 2773 (1967).

E. Bisagni, J. P. Marquet, J. Andre-Louisfert, *Bull. Soc. Chim. Fr.* **1968**, 637.