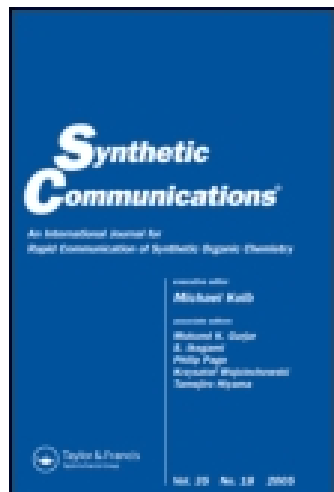




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Microwave-Mediated Debromination of *vicinal*-Dibromides

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Abstract: Debromination of *vicinal*-dibromides to E-alkenes is reported using inorganic solid supports (silica gel or acidic alumina) under microwave irradiation.

Keywords: Debromination, inorganic solid support, microwaves, stereoselective, *vic*-dibromides

The olefins can be regenerated from *vicinal*-dibromides with a variety of reagents^[1] and the overall bromination/debromination process represents a means of protection and deprotection^[2] of olefins. Our group has reported solvolytic stereoselective debromination of *vic*-dibromides by N,N-dimethylformamide (DMF)^[3,4] and hexamethylphosphoramide (HMPA)^[5] without the aid of any reagent. Different methods^[6,7] reported in literature for debromination have their own advantages and disadvantages.

We report herein the first study on stereoselective debromination of *vic*-dibromides (I) adsorbed on inorganic solid support (silica gel or acidic alumina) under microwave irradiation^[8] to give the corresponding E-olefins (II) (Fig. 1). Microwave-mediated debromination has been carried out on a variety of *vic*-dibromides (Table 1) within periods of 1–5 min.

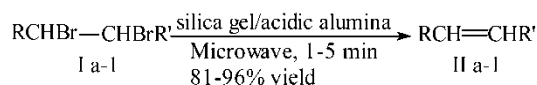


Figure 1. Debromination of *vicinal*-dibromides under microwave irradiation.

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Table 1. Reactions of *vic*-dibromides under microwave irradiation on inorganic solid support

S. No.	Substrates	Silica gel		Acidic alumina	
		Time (min)	Isolated yield (%) (II)	Time (min)	Isolated yield (%) (II)
1	<i>meso</i> -Stilbene dibromide (Ia)	2	95	2	96
2	<i>dl</i> -Stilbene dibromide (Ib)	2	84 (89) ^a	2	84 (91) ^b
3	<i>meso</i> -4-Chlorostilbene dibromide (Ic)	4	90	4	96
4	<i>meso</i> -4-Methylstilbene dibromide (Id)	3	91	3	95
5	<i>meso</i> -4,4'-Dichlorostilbene dibromide (Ie)	5	92	5	96
6	<i>meso</i> -4-Methoxystilbene dibromide (If)	1	82	1	86
7	<i>meso</i> - α,β -Dibromosuccinic acid (Ig)	1	96	1	98
8	<i>dl</i> - α,β -Dibromosuccinic acid (Ih)	1	95	1	98
9	<i>trans</i> -1,2-Dibromocyclooctane (Ii)	2	81	2	81
10	<i>trans</i> -1,2-Dibromocyclohexane (Ij)	10	84	10	85
11	Dihydrocinnamic acid dibromide (Ik)	— ^c	—	— ^c	—
12	Cholesterol dibromide (Il)	— ^d	—	— ^d	—
13	<i>meso</i> -Stilbene dichloride (Im)	2	21	2	37

^aYield in bracket is HPLC yield. 11% *Z*-stilbene was also formed.^bYield in bracket is HPLC yield. 9% *Z*-stilbene was also formed.^cStarting material recovered.^dDecomposition of starting material was observed.

TYPICAL PROCEDURE

meso-Stilbene dibromide (0.5 g), dichloromethane (5 ml), and silica gel or acidic alumina (2 g) were mixed thoroughly in a beaker. The adsorbed material was dried and then exposed to microwave irradiation. After 2 min, the residue was extracted with ethyl acetate (3 × 10 ml). The combined ethyl acetate extract was dried over anhyd. MgSO₄, filtered, and concentrated to afford E-stilbene (0.25 g, 95%); mp 122°C, lit. mp^[9] 124°C.

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REFERENCES

1. Larock, R. C. *Comprehensive Organic Transformations*, 2nd ed.; Wiley-VCH: New York, 1999; p. 260.
2. Greene, T. W.; Wuts, P. G. M. *Protecting Groups in Organic Synthesis*, 3rd ed.; Wiley-Interscience: New York, 1991.
3. Khurana, J. M.; Maikap, G. C. *J. Org. Chem.* **1991**, 56, 2582.
4. Khurana, J. M.; Maikap, G. C.; Sahoo, P. K. *Synthesis* **1991**, 827.
5. Khurana, J. M.; Bansal, G.; Chauhan, S. *Bull. Chem. Soc. Jpn.* **2001**, 74, 1089.
6. Ranu, B. C. *Euro. J. Org. Chem.* **2000**, 13, 2347.
7. Ibne-Rasa, K. M.; Ahmad, A. *J. Sci. Res. (Lahore)* **1968**, 3 (2), 1.
8. Varma, R. S. *Advances in Green Chemistry: Chemical Synthesis using Microwave Irradiation*; Kavitha Printers: Bangalore, India, 2002.
9. Buckingham, J. Ed.; *Dictionary of Organic Compounds*, 5th ed.; Chapman & Hall: New York, 1982; p. 225.