TABLE V

Estimated Costs of Producing 10 Million Lb Nylon-9 Per Year[a]

Item	Costs based on 35.5% yields[b]		Costs based on 100% yields[c]	
	$/yr	$/lb	$/yr	$/lb
Capital costs	$11,083,000		$9,210,000	
Operating costs				
Raw materials[d]	17,114,000	1.711	6,210,000	0.621
Utilities	800,000	0.880	700,000	0.070
Labor	460,000	0.046	460,000	0.046
Maintenance	665,000	0.067	552,000	0.055
Payroll extras	92,000	0.009	92,000	0 009
Amortization	1,578,000	0.158	1,320,000	0.132
Taxes and insurance	111,000	0.011	92,000	0.009
General and administrative	1,020,000	0.102	484,000	0.049
Total operating costs	21,840,000	2.184	9,910,000	0.991

[a]Calculations were made in early 1973.

[b]20.9 lb nylon-9 per 100 lb oleonitrile.

[c]58.9 lb nylon-9 per 100 lb oleonitrile.

[d]Including 47,600,00 and 16,900,00 lb, respectively, of oleonitrile at $0.2975/lb.

on commercial oleonitrile as the starting material at a cost of $0.2975/lb. Seven major processing steps were included: ozonolysis, esterification, distillation, hydrogenation, hydrolysis, purification, and polymerization.

A major factor influencing estimated cost is yield (Table V). It is quite evident that further process studies are needed to improve the overall yield of 35.5%, which results in a prohibitively high production cost of $2.18/lb. Even at 100% yield, the cost is $0.99/lb. However, no byproduct credit was taken, and sale of such byproducts as methyl pelargonate and methyl palmitate could significantly reduce the cost. About 2 lb of methyl pelargonate are produced for every pound of nylon-9 at the 35.5% yield. Although pelargonates are useful in plasticizers and synthetic ester lubricants, there might be problems associated with disposing of such a large amount (20 million lb/yr). At 100% yields, there would be about a 1:1 wt ratio for these products. Excluding raw materials, processing costs are $0.47 and $0.37/lb of nylon-9 at respective yields of 35.5% and 100%.

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REFERENCES

1. Genas, M., Angew. Chem. 74:535 (1962).
2. Pryde, E.H., and J.C. Cowan, in "Condensation Monomers," Edited by J.K. Stille and T.W. Campbell, Wiley-Interscience, New York, N.Y., 1972, pp. 63-73.
3. Greene, J.L., Jr., R.E. Burks, Jr., and I.A. Wolff, Ind. Eng. Res. Develop. 8:171 (1969).
4. Greene, J.L., Jr., E.L. Huffman, R.E. Burks, Jr., and W.C. Sheehan, J. Polym. Sci. Part A-1 5:391 (1967).
5. Perkins, R.B., J.J. Roden III, A.C. Tanquary, and I.W. Wolff, Mod. Plast. 46:136 (1969).
6. Miller, W.R., E.H. Pryde, R.A. Awl, W.L. Kohlhase, and D.J. Moore, Ind. Eng. Chem. Prod. Res. Develop. 10:442 (1971).
7. Kohlhase, W.L., E.H. Pryde, and J.C. Cowan, JAOCS 47:183 (1970).
8. Awl, R.A., E.H. Pryde, D. Weisleder, W.K. Rohwedder, and J.C. Cowan, Ibid. 48:232 (1971).
9. Horn, C.F., B.T. Freure, H. Vineyard, and H.J. Decker, J. Appl. Polym. Sci. Part A-2 4:817 (1960).
10. Carpenter, A.S., and F. Reeder (Courtaulds, Limited), Brit. Pat. No. 741,739 (1955).
11. Throckmorton, P.E., L.I. Hansen, R.C. Christenson, and E.H. Pryde, JAOCS 45:59 (1968).
12. Throckmorton, P.E., and E.H. Pryde, Ibid. 49:643 (1972).
13. Kaplan, W. (Sun Chemical Corp.), U.S. Pat. No. 2,444,828 (1948).
14. Harman, R.E., E.A. Ham, W.A. Bolhofer, and N.G. Brink, J. Amer. Chem. Soc. 80:5176 (1958).
15. Rosenthal, A.J., Text Res. J. 36:593 (1966).

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ERRATUM

In the article by D.N. Grindley and S.A. El Sarrag entitled "The Oxidation of 9:10 Diketostearic Acid by Peracetic Acid (Baeyer & Villiger Reaction)" (JAOCS 49:338 (1972), the reference by N.A. Khan and M.S. Newman was cited incorrectly. It should be J. Org. Chem. 17:1063 (1952).