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BIPHENYL THREAT

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Here is my analysis of the biphenyl (only) threat which I agreed to supply at our last meeting.

COMPETITIVE BIPHENYL

Question: At what purchase price for Biphenyl would we consider shutting down our own plant?

Answer: When our out-of-pocket costs would be lower than for self-manufacture.

Calculations:

Std. out-of-pocket costs (1969) at 5.47M#/mo. rate

Out-of-pocket

RM's	$3.08/100#
Directs	1.18
Indirects	.03
	$4.29

Handling costs for purchased Biphenyl

Material losses at .3%	$650/mo.
Steam	300
Electric	200
Packing labor + O.H.	1600
Labor - handling 2 cars/day	1200
Supervision	500
O.H.	350
Supplies	100
Lab	300
Mech. Expense (including standby	2000

$7200/5.47 \times 10^4 = \$.13/100\#$

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Break even price

4.29	out of pocket cost
- .13	Handling of purchased Biphenyl
$4.16	Delivered price
- .80	Typical freight (maybe 800 miles)
$3.35/100#	Net back to supplier

Assuming the supplier was willing to accept a low 20% return on the sales dollar -- his gross profit would be -- $.672/100# x 5.47 x 10^4 or $36,700/month or $440,000/yr. Under good conditions, his after tax income would be about $150,000 to $200,000. If supplier was willing to accept 8% after taxes ROI, this net income would support a capital investment of about $1.8M to $2.5M.

BUT! Suppliers manufacturing cost would have to be a low, low $2.69/100#. Assuming that the lowest possible total conversion cost would be $.90/100# (ours is 1.40 to 2.60 depending on rate) he would have to obtain RM's at about $1.80/100#. This would translate to a benzene price of about 11-12¢/gal (we pay about 21.5¢/gal.) --- an alternative to this would be to use a Biphenyl rich byproduct stream which in a dealkylation unit would normally be recycled. Previous evaluations have indicated that recovery and refining of the Biphenyl from such a stream would cost about the same as conversion costs for direct manufacture of Biphenyl. Since the recycle of Biphenyl is said to surpress further formation and, therefore, increase yields of desired products, it wouldn't make sense to value the stream at less than feed stock cost.

This is against USA cost which runs about 5¢/#.

Conclusion:

1. It seems unlikely that we will ever be offered Biphenyl at a price that would make us shut down our units.

2. Since the Biphenyl market per se is not currently large enough to support a sizeable new capital investment, the only reason for competitive entry into biphanyl production would relate to:

   - Change in the Biphenyl market (new uses)
   - Supply for entry into the Aroclor market or for other dirivatives of Biphenyl.

3. Several companies could achieve high quality Biphenyl in large quantities at near our cost if they chose to do so.

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