PLAINTIFF'S EXHIBIT

CC-351

GEORGE F. ADAMS
POST OFFICE BOX 1291
TULSA, OKLAHOMA 74101

PHONE: 918 587.7591

November 9, 1966

Mr. Harry A. Brown
Coastal States Petrochemical Co.
Houston, Texas

Dear Harry,

Foster Wheeler has completed the pilot plant test runs on the cracking of isobutane at high pressure. They made two runs, one at 53% conversion and the other at 37% conversion. The yield distribution and operating conditions are summarized and attached to this letter.

From the pilot plant tests, we have learned the following facts. These points were the key elements in the feasibility of our simplified isobutane pyrolysis scheme.

1. It is feasible to crack isobutane at a pressure of 250 lbs. and obtain a satisfactory product distribution. This means that it will not be necessary to have a compressor between the cracking section and the recovery section.

2. The cracking pattern of isobutane is such that isobutylene of a concentration of up to 98% can be separated by simple fractionation without the need for acid extraction. Butene-1, which cannot be separated by fractionation, is produced in quite small quantities.

3. The cracking of isobutane at this pressure apparently produces very little diolefins or acetylenes and it is probable that no hydrogen treating would be required of the products.

It therefore seems feasible, then, that a plant could be designed for isobutane pyrolysis that would be simply a cracking furnace and a fractionation train. This was the hope that we had in embarking on the pilot test work. I am attaching a sketch showing the flow of such a process scheme.

The data developed by Foster Wheeler might need some refinement, and perhaps another pilot plant test run or two, before it is entirely suitable for plant design. However, I feel that at this point the next

step to take in the investigation of this process would be a very rough process design of the plant as we envision it and an approximate cost estimate. The process design and cost estimate will enable us to see whether the process will be basically economic and will give us ideas where either operating or investment cost might be saved by slightly different conversion levels or operating conditions.

I would like to suggest that we request Foster Wheeler to proceed with this rough process design and cost estimate. If you agree, I believe it will be desirable for me to meet with them to discuss this work and our ideas on how the process should be designed before they begin the work. We can discuss this by telephone and arrange some satisfactory schedule if you agree.

I believe that the idea of high pressure isobutane cracking integrated with a simple fractionation system is sufficiently novel that it would be advisable to record the data and the process scheme for possible patent protection. If you like, I could take the initial steps in this regard with the patent firm, Head and Johnson, who does my work here in Tulsa, or I could handle this with your attorneys in Houston during my next visit. Please let me know your desires in this matter.

Sincerely,

George F. Adams

George F. Adams

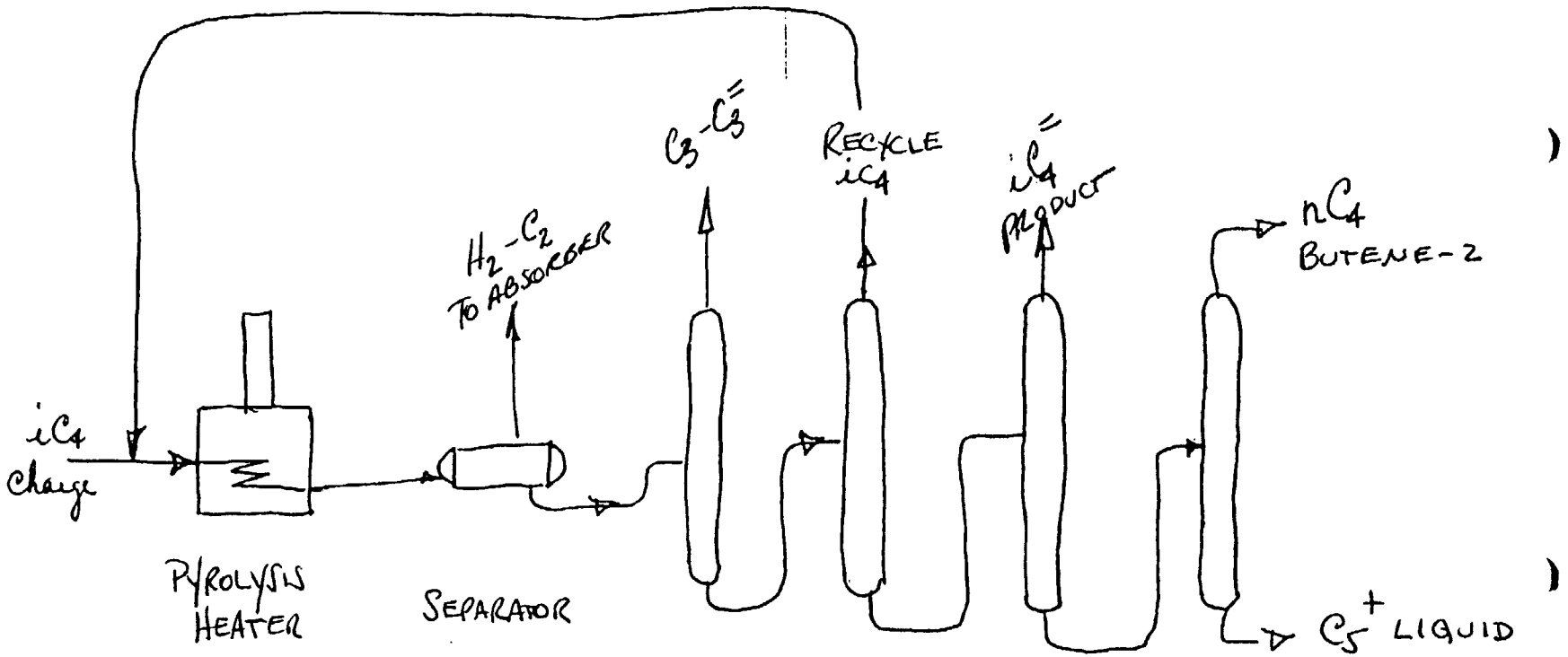
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HIGH PRESSURE CRACKING OF ISOBUTANE

DATA FROM FOSTER WHEELER TEST RUNS
(RECEIVED BY PHONE, SUBJECT TO CONFIRMATION)

		Run No. 1	Run No. 2
Coil outlet, °F		1330	1305
" " , psig		240	240
Residence time, sec.		1.25	1.25
Steam rate, #/#		0.5	0.5
Yields, wt %			
Hydrogen	H_2	0.62	0.22
Methane	CH_4	8.12	4.64
Ethylene	C_2H_4	1.38	0.83
Ethane	C_2H_6	.74	0.32
Propylene	C_3H_6	13.66	8.68
Propane	C_3H_8	2.15	1.40
Isobutylene +	C_4H_8	19.52	13.71
	Butene-1	0.40	0.24
	Butene-2	0.07	0.08
Isobutane	iC_4H_{10}	45.7	60.16
N. butane	nC_4H_{10}	1.58	4.47
Feed	C_3H_8	0.20	0.20
Isobutane	iC_4H_{10}	97.3	97.3
Normal butane	nC_4H_{10}	2.5	2.5

PROPOSED ISOBUTANE CRACKING PROCESS



11/8/66
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