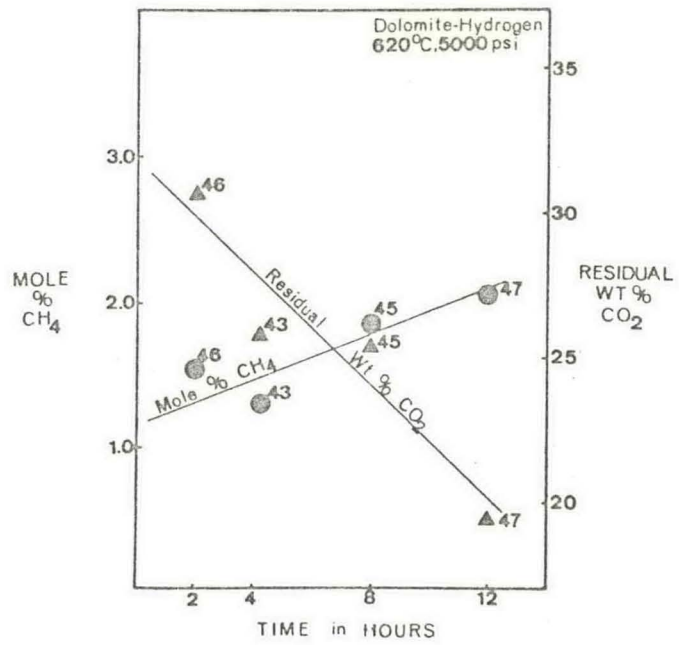

FIG. 10. Plot of mole % CH_4 generated and the residual wt % CH_2 in the solid for the dolomite-hydrogen system at 620°C; 5000 psi (H_2); for 2, 4, 8, and 12 hour experiments.

only in very small amounts. Both of these experiments were run at a lower pressure of 2000 psi. The discussion on the reaction gases for the calcite-hydrogen experiments applies also to the dolomite-hydrogen system.

The kinetics of the dolomite-hydrogen system are considerably more complex than in the calcite-hydrogen system. An evaluation of the rate constant for each successive concentration-reaction time pair at 620°C assuming the reaction is first, second or third order, shows wide scatter, and no trend for the rate constant. The wide divergence from linearity is illustrated by a plot of the Arhennius equation for a plot of the six temperature-concentration pairs. An interpretation of kinetic data into physical terms for this system is not realistic with the limited data available.

SIDERITE AND H_2

The reaction between one-half gram of 40 to 60 mesh siderite fragments and hydrogen is more complex than the preceding calcite-hydrogen and dolomite hydrogen reactions. It is also the least studied with only four experiments. These four runs were between 400 to 605°C and 2000 to 5000 psi (H_2), all for 4 hours. A "thermal soak" under helium was used in

TABLE 4. MASS SPECTROGRAPHIC ANALYSES OF REACTION GASES[a-b-c] AND WET-CHEMICAL ANALYSES OF RESIDUAL CO_2 IN UNREACTED DOLOMITE: DOLOMITE-HYDROGEN SYSTEM

Experiment No.	40	41	42	43	44	45	46	47	49	50	51	56	57	58	59	83	84
Temperature (°C)	520	525	550	620	735	620	620	620	735	735	735	735	735	735	835	605	605
	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	4,000	4,000	5,000	2,000	2,000