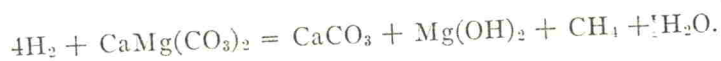


FIG. 9. Plot of mole % CH₄ generated and residual wt % CO₂ in the solid for the dolomite-hydrogen system at 5000 psi (H₂); 4 hour experiments; at temperatures of 525, 550, 620, and 735°C.



At 5000 psi (H₂) reaction initiates as low as 520°C (Table 4). Calcite formed from dolomite persists at higher temperatures than does calcite alone in the calcite-hydrogen system. Similarities exist between the thermal dissociation of carbonates and the reaction of carbonates with hydrogen. In the dolomite-hydrogen system CH₄ may influence the reaction in a manner similar to CO₂ in the thermal decomposition of calcite. This possibility will be explored in future studies.

Mg(OH)₂ or MgO formed in the first stage is non-crystalline to X-rays. Chemical analyses by atomic absorption indicates 17% MgO in the solid reaction products.

A very minor amount of black lustrous material is present in the reaction products. It is similar in all appearances to the graphite formed in the calcite experiments. "Soot-like" material also was present in the bomb, and again was particularly noticeable at higher temperatures.

The reaction gases were those also present in the calcite experiments. (Table 4). Carbon dioxide appears in two experiments (nos. 83, 84) but

ALOTTI

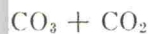
of calcite always shows
s dolomite showed unlike
The crystallographic
mined optically on the
at the *c* axis does not pass
reacted faces. The crystal
more than a loss of the

EN

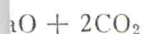
the following conditions
5°C; (3) 2000 to 5000 psi
lasting between 2 and 12
aCO₃(calcite); Ca(OH)₂
carbon or graphite, and
and CO₂. Water is the oxy-

Table 4 and plotted in
aining in the solid and the
ainst time at 5000 psi for
r 4-hour runs.

ler the vapor pressure of
s. The first dissociation
s:



alcite decomposes to lime
temperature determined
never exceeds 100 mm,
ion as follows:



ot a reaction product un-
appears only as a minor
ogen pressures (Table 4).
direct methanation. The
te-hydrogen gas analyses
ing the calcite-hydrogen

o steps. The first stage is