

يوجد في الطبيعة العشرات من معادن الكربونيت ذات التركيب الكيميائي والبنائي المختلف التي غالباً ما تنتشر في معظم ترب المناطق الجافة وشبه الجافة، وأن لهذه

(Liang *et al.*, 1996a)

pH

(Zuddas & Mucci, 1998; Manoli & Dalas, 2000)

(Zuddas & Mucci, 1998)

Sheikholeslami & Ong (2003)

crystal size,

(Mg⁺²)

Loste *et al.* (2003)

Meldrum & Hyde (2001)

(Liang *et al.*, 1996a,1996b; DeLeeuw & Parker, 2000; 1998a; 1998b)

(%10)

Reddy & Wang (1980)

(Meldrum & Hyde, 2001)

Compton & Brown (1994)

Arvidson & Mackenzie (2000)

low Mg-calcite

%10

(LMC)

high Mg-calcite (HMC)

"

% 25

CaCO₃

conversion

"

Compton & Brown, 1994; Mcbrid, 2000; Schubel *et al.*, 2000;

.(Deleuw, 2000)

IAP CaCO₃

Zuddas & Mucci (1998)

$2 \cdot 10^{-8} = \text{IAP}$

Levey *et al.* (1982)

.3.1

IAP/Ksp

IAP

10^{-1} . 0.02 7 pH 10^{-1} . 0.01
 7 pH
 0.18 0.15 0.09 0.03 0.008
 1 . 10^{-1} . 0.24
 10^{-1} .
 10^{-1} . 0.5
 Analytical grade

()
) ° 1±15
 ° 1±30
 ()
 . 600 300 200 100 (72 48 24 :
 Whatman (41)

E.C pH
 " Page *et al.* (1982)

.Davies (1962)

:

Burton *et al.* (1951) : "
 Burton *et al.* ,(1951)

10^{-1} 2 .

ثانياً: Davies & Jonese (1955)

أقترح Davies & Jonese (1955) نموذجين لحساب ثابت سرعة تبلور الكالسايت حيث تصف المعادلة التالية النموذج الأول :

$$R = -dCa/dt = k_2 S ([Ca] - [Ca]_{eq}) ([CO_3] - [CO_3]_{eq}) \dots\dots [1]$$

$$[]_{eq} []$$

$$S \quad k$$

$$[]_{eq} []$$

$$S \quad k$$

:

(f)

.Davies (1962)

$$R = SKf_2^2 ([Ca^{+2}]^{1/2} [CO_3]^{1/2} - K_{sp}^{1/2} f_2^{-1}) \dots\dots [2]$$

Raddy & Nancollas (1971) :

Raddy & Nancollas (1971)

$$-dq/dt = K_{rxn} \{ [q/q_{eq}] - 1 \}^n = K_{rxn} \{ S - 1 \}^n \dots\dots [3]$$

$$-[dq/dt]_o = K_{rxn} \{ S_o - 1 \}^n$$

$$\text{Log}[-dq/dt]_o = \text{Log } K_{rxn} + n \text{Log}[S_o - 1] \dots\dots [4]$$

$$n \left(\frac{1}{\{[Ca^{+2}][CO_3^{-2}]\}^{2/1}} \right) = \frac{K_{rxn}}{S} \quad \text{Order of reaction}$$

$$\{[Ca^{+2}][CO_3^{-2}]\}^{2/1} = \frac{q}{q_{eq}} \quad \text{supersaturation}$$

$$\log \{-[dq/dt]\} = (n) \log[S-1] + \log K_{rxn}$$

Burton *et al.* (1951)

(1)

(Plummer *et al.*, 1996; Drybodd *et al.*, 2003)

$$r=0.84^{**} \quad (1) \quad r=0.99^{**}$$

%1
Reddy *et al.* (1971)

11.25 11.5 14.5 20

% 12.75 10.25

% 86

72

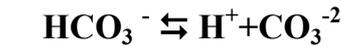
%90.5

(1)

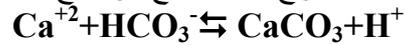
(Stumm & Morgan, 1981)

Inskeep & Bloom (1986)

pH



الأ ان (1981) . Reddy *et al.* اقترح ثلاث صيغ لتوضيح تلك الاختلافات وهي:-



(Hammes *et al.*, 2003)

Davies & Jones (1955)

(2)

(%1)

(72)

(R²=0.98**) إلى (R²=0.99**)

()

-:

-1

(1)

-2

(2)

1- . 1- . 1- . 57.38

11

72

1-

. 1- . 1-

46

Inskeep & Bloom (1986)

Davies & Jones (1955)

%1 " (2)

:

(R²=0.92**) (R²=0.91**)

.Kezmierzzak *et al.* (1982) House (1981)

(Inskeep & Bloom, 1986; Chong & Sheikholeslemi, 2003)

Davies & Jones
Reddy & Nancollas (1971)

(Sheikholeslemi & Ong, 2003)
Davies & Jones

Reddy & Nancollas (1971)

(4 3)

spontaneous sarge %1
(R²=0.93**) () stage
(R²=0.89**) (1) (n) (R²=0.97**)

و Gutjahr *et al.* (1996) و Plummer & Busenberg (1982)

(n) Chong & Sheikholeslam. (2004)
 (1.61) (1.16)
 Krxn
 2.72×10^{-3} Krxn
 8.6×10^{-7}
 -300 .(300
 400

4.4×10^{-3} 1.04×10^{-5}
 1.29×10^{-3}
 (4)

(Chong & Sheikholeslemi, 2003)

Nancollas & Reddy (1977)

n=1.16 ($R^2=0.968$)

(4 3)

:" -:

"

$30 > \Omega > 4$

(Nancollas & Reddy, 1977). حيث (Ω) تمثل نسبة التشبع (IAP/Ksp).

(Krxn)

:

(10< Ω)

(Reddy & Gaillard, 1981)

"

.Chong *et al.* 2004)

-"

(Morase,1983)

"

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Physiochemical Behavior of Carbonate Minerals in Soils, Sediments and Waters of Tidal Flats, North West Arabian Gulf and The Shatt Al-Arab

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abstract

Physiochemical behavior of carbonate minerals in soils, sediments and water of tidal flats northern west part of Arabian Gulf and Shatt Al-Arab river is important for classification carbonate minerals. A laboratory experiment was conducted by using concentration from sodium bicarbonate solution (0.008, 0.03, 0.09, 0.15, 0.18, 0.24) mol.liter⁻¹ were mixed calcium chloride 0.01 mol.liter⁻¹ treated with different volume from sodium chloride to obtained fixed ionic strength. This solution has been incubated at two temperature degrees (15,30 c°) in six different time (24, 48, 72, 100, 200, 300, 600 h) and then Ph, E.C, Ca⁺², HCO₃ total alkalinity) have been measured in these solutions composition Davies & Jones or Reddy & Nancollass were used to describe the mechanical of carbonate minerals precipitation. It is consisted of suddenly precipitation of calcium carbonate and the crystal growth formation. precipitation coefficient rate for the first stage is more than the second stage.