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DECUS NO.	FOCAL8-204
TITLE	ACID-BASE EQUILIBRIA
AUTHOR	F. R. Johnson
COMPANY	Dow Badische Company Freeport, Texas
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## ACID-BASE EQUILIBRIA

DECUS Program Library Write-up

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C-FOCAL., 1968

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01.10 C ACID - BASE EQUILIBRIA
01.11 E
01.13 S KW=1/1014
01.14 T "TASKS ARE:""1 KNOWN [H+]"2 KNOWN [OH-]"3 KNOWN PH"
01.15 T "4 KNOWN POH"5 KNOWN M & KA"6 KNOWN M & KB"
01.16 T "7 KNOWN M ACID & M SALT BUFFER"3 KNOWN M BASE & M SALT BUFFER
01.18 A "TASK ",R;I (R-1)1.1,1.21;I (R-3)1.31,1.41;I (R-5)1.51,1.61
01.19 I (R-7)1.65,1.71,1.81
01.21 A "[H+] ",H," /10P",P,!!;S H=H/10P
01.22 S OH=KW/H
01.23 S PH=(-FLOG(H))*0.4343;S POH=(-FLOG(OH))*0.4343;G 1.9
01.31 A "[OH-] ",OH," /10P",P,!!;S OH=OH/10P
01.32 S H=KW/OH;G 1.23
01.41 A "PH ",PH,!!
01.42 S POH=14-PH
01.43 S H=FEXP(-2.30258*PH);S OH=FEXP(-2.30258*POH);G 1.9
01.51 A "POH ",POH,!!
01.52 S PH=14-POH;G 1.43
01.61 A "M ",M," KA ",KA," /10P",P,!!;S KA=KA/10P
01.62 S H=FSQT(M*KA);G 1.22
01.65 A "M ",M," KB ",KB," /10P",P,!!;S KB=KB/10P
01.66 S OH=FSQT(M*KB);G 1.32
01.71 A "M OF ACID ",MA," KA ",KA," /10P",P;S KA=KA/10P
01.72 A " M OF BUFFERING SALT ",MS,!!
01.73 S H=KA*(MA/MS);G 1.22
01.81 A "M OF BASE ",MB," KB ",KB," /10P",P;S KB=KB/10P;D 1.72
01.82 S OH=KB*(MB/MS);G 1.32
01.90 C OUTPUT SECTION
01.91 T Z,"[H+] =",H,!
01.92 T "[OH-] =",OH,!
01.93 T Z11.02,"PH =",PH,!
01.94 T "POH =",POH,!!!
01.99 G 1.13
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Acid-Base Equilibria will calculate hydrogen ion concentration, hydroxyl ion concentration, pH, and poH based on a variety of inputs.

C

TASKS ARE:

- 1 KNOWN [H+]
- 2 KNOWN [OH-]
- 3 KNOWN PH
- 4 KNOWN POH
- 5 KNOWN M & KA
- 6 KNOWN M & KB
- 7 KNOWN M ACID & M SALT BUFFER
- 8 KNOWN M BASE & M SALT BUFFER

TASK 1 [H+] 5.0 /10<sup>3</sup>

[H+] = 0.500000E-02  
[OH-] = 0.200000E-11  
PH = 2.30  
POH = 11.70

TASK 2 [OH-] 1.2 /10<sup>10</sup>

[H+] = 0.833334E-04  
[OH-] = 0.120000E-09  
PH = 4.08  
POH = 9.92

TASK 3 PH 3.25

[H+] = 0.562351E-03  
[OH-] = 0.177339E-10  
PH = 3.25  
POH = 10.75

TASK 4 POH 4.07

[H+] = 0.117496E-09  
[OH-] = 0.851158E-04  
PH = 9.93  
POH = 4.07

TASK 5 M .1 KA 1.8 /10<sup>5</sup>

[H+] = 0.134164E-02  
[OH-] = 0.745353E-11  
PH = 2.87  
POH = 11.13

TASK 6 M .25 KB 1.8 /10<sup>5</sup>

[H+] = 0.471405E-11  
[OH-] = 0.212132E-02  
PH = 11.33  
POH = 2.67

TASK 7 M OF ACID .1 KA 6.6 /1015 M OF BUFFERING SALT .5

[H+] = 0.132000E-04  
[OH-] = 0.757577E-09  
PH = 4.38  
POH = 9.12

TASK 8 M OF BASE .5 KB 1.3 /1015 M OF BUFFERING SALT .1

[H+] = 0.111111E-09  
[OH-] = 0.900000E-04  
PH = 9.05  
POH = 4.05

TASK 9 01.00

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