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TABLES OF ISOTOPE EFFECT FUNCTIONS FOR HOMOCOMPETITIVE FIRST-ORDER REACTIONS

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SUPPLEMENT

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CHEMISTRY DIVISION

TABLES OF ISOTOPE EFFECT FUNCTIONS FOR HOMOCOMPETITIVE FIRST-ORDER REACTIONS

SUPPLEMENT

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Given in Table 4 are supplemental data to ORNL-2678 of April 24, 1959, representing calculations of R for values of k^*/k from 0.950 to 0.998 in increments of 0.002, and for values of f from zero to 0.5 in increments of 0.1. All symbols have the same meanings as defined in ORNL-2678. All numbers in the table are in exponentiated form, where e - 1 represents, for example, 10^{-1}. Thus 9.50000 e - 1 signifies 0.95.

Given in Figure 6 are plots of the data of Table 4.

Table 4

Table of Isotope Effect Functions for

$k^*/k = .950 - .998$ and $f = .1 - .5$

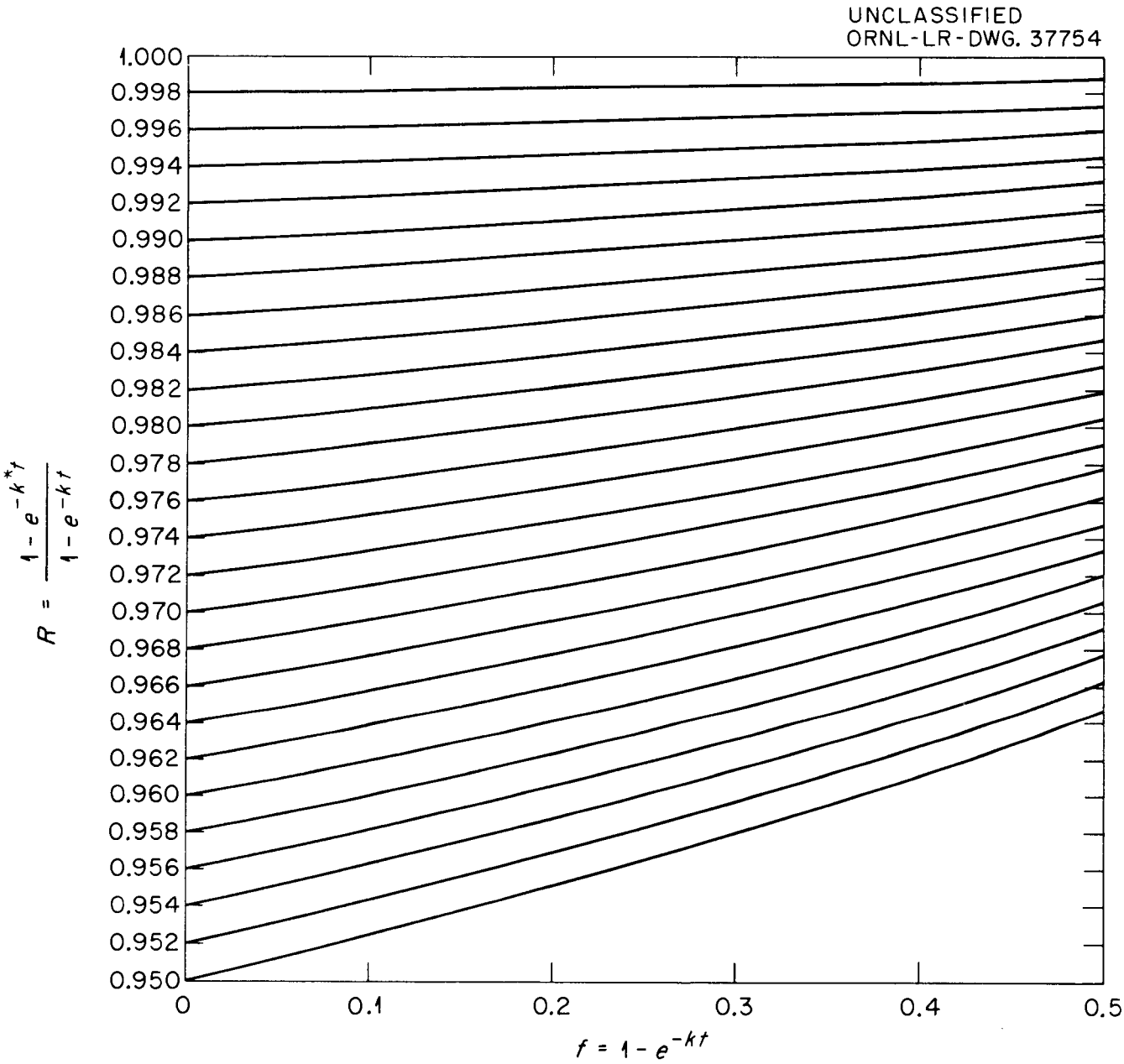
k^*/k	f	R
9.50000 e- 1	1.00000 e- 1	9.52463 e- 1
9.50000 e- 1	2.00000 e- 1	9.55121 e- 1
9.50000 e- 1	3.00000 e- 1	9.58015 e- 1
9.50000 e- 1	4.00000 e- 1	9.61195 e- 1
9.50000 e- 1	5.00000 e- 1	9.64735 e- 1
9.52000 e- 1	1.00000 e- 1	9.54369 e- 1
9.52000 e- 1	2.00000 e- 1	9.56926 e- 1
9.52000 e- 1	3.00000 e- 1	9.59708 e- 1
9.52000 e- 1	4.00000 e- 1	9.62766 e- 1
9.52000 e- 1	5.00000 e- 1	9.66169 e- 1
9.54000 e- 1	1.00000 e- 1	9.56275 e- 1
9.54000 e- 1	2.00000 e- 1	9.58730 e- 1
9.54000 e- 1	3.00000 e- 1	9.61401 e- 1
9.54000 e- 1	4.00000 e- 1	9.64336 e 1
9.54000 e- 1	5.00000 e- 1	9.67601 e- 1
9.56000 e- 1	1.00000 e- 1	9.58180 e- 1
9.56000 e- 1	2.00000 e- 1	9.60533 e- 1
9.56000 e- 1	3.00000 e- 1	9.63093 e- 1
9.56000 e- 1	4.00000 e- 1	9.65904 e- 1
9.56000 e- 1	5.00000 e- 1	9.69032 e- 1
9.58000 e- 1	1.00000 e- 1	9.60085 e- 1
9.58000 e- 1	2.00000 e- 1	9.62336 e- 1
9.58000 e- 1	3.00000 e- 1	9.64783 e- 1
9.58000 e- 1	4.00000 e- 1	9.67470 e- 1
9.58000 e- 1	5.00000 e- 1	9.70460 e- 1

k^*/k	f	R
9.60000 e- 1	1.00000 e- 1	9.61990 e- 1
9.60000 e- 1	2.00000 e- 1	9.64137 e- 1
9.60000 e- 1	3.00000 e- 1	9.66472 e- 1
9.60000 e- 1	4.00000 e- 1	9.69035 e- 1
9.60000 e- 1	5.00000 e- 1	9.71886 e- 1
9.62000 e- 1	1.00000 e- 1	9.63894 e- 1
9.62000 e- 1	2.00000 e- 1	9.65938 e- 1
9.62000 e- 1	3.00000 e- 1	9.68160 e- 1
9.62000 e- 1	4.00000 e- 1	9.70599 e- 1
9.62000 e- 1	5.00000 e- 1	9.73310 e- 1
9.64000 e- 1	1.00000 e- 1	9.65798 e- 1
9.64000 e- 1	2.00000 e- 1	9.67738 e- 1
9.64000 e- 1	3.00000 e- 1	9.69846 e- 1
9.64000 e- 1	4.00000 e- 1	9.72160 e- 1
9.64000 e- 1	5.00000 e- 1	9.74733 e- 1
9.66000 e- 1	1.00000 e- 1	9.67702 e- 1
9.66000 e- 1	2.00000 e- 1	9.69537 e- 1
9.66000 e- 1	3.00000 e- 1	9.71532 e- 1
9.66000 e- 1	4.00000 e- 1	9.73720 e- 1
9.66000 e- 1	5.00000 e- 1	9.76153 e- 1
9.68000 e- 1	1.00000 e- 1	9.69605 e- 1
9.68000 e- 1	2.00000 e- 1	9.71335 e- 1
9.68000 e- 1	3.00000 e- 1	9.73216 e- 1
9.68000 e- 1	4.00000 e- 1	9.75279 e- 1
9.68000 e- 1	5.00000 e- 1	9.77571 e- 1

k^*/k	f	R
9.70000 e- 1	1.00000 e- 1	9.71508 e- 1
9.70000 e- 1	2.00000 e- 1	9.73133 e- 1
9.70000 e- 1	3.00000 e- 1	9.74899 e- 1
9.70000 e- 1	4.00000 e- 1	9.76836 e- 1
9.70000 e- 1	5.00000 e- 1	9.78988 e- 1
9.72000 e- 1	1.00000 e- 1	9.73410 e- 1
9.72000 e- 1	2.00000 e- 1	9.74930 e- 1
9.72000 e- 1	3.00000 e- 1	9.76580 e- 1
9.72000 e- 1	4.00000 e- 1	9.78391 e- 1
9.72000 e- 1	5.00000 e- 1	9.80402 e- 1
9.74000 e- 1	1.00000 e- 1	9.75312 e- 1
9.74000 e- 1	2.00000 e- 1	9.76726 e- 1
9.74000 e- 1	3.00000 e- 1	9.78261 e- 1
9.74000 e- 1	4.00000 e- 1	9.79945 e- 1
9.74000 e- 1	5.00000 e- 1	9.81815 e- 1
9.76000 e- 1	1.00000 e- 1	9.77213 e- 1
9.76000 e- 1	2.00000 e- 1	9.78521 e- 1
9.76000 e- 1	3.00000 e- 1	9.79940 e- 1
9.76000 e- 1	4.00000 e- 1	9.81497 e- 1
9.76000 e- 1	5.00000 e- 1	9.83225 e- 1
9.78000 e- 1	1.00000 e- 1	9.79114 e- 1
9.78000 e- 1	2.00000 e- 1	9.80315 e- 1
9.78000 e- 1	3.00000 e- 1	9.81619 e- 1
9.78000 e- 1	4.00000 e- 1	9.83048 e- 1
9.78000 e- 1	5.00000 e- 1	9.84634 e- 1

k^*/k	f	R
9.80000 e- 1	1.00000 e- 1	9.81015 e- 1
9.80000 e- 1	2.00000 e- 1	9.82109 e- 1
9.80000 e- 1	3.00000 e- 1	9.83296 e- 1
9.80000 e- 1	4.00000 e- 1	9.84597 e- 1
9.80000 e- 1	5.00000 e- 1	9.86041 e- 1
9.82000 e- 1	1.00000 e- 1	9.82915 e- 1
9.82000 e- 1	2.00000 e- 1	9.83901 e- 1
9.82000 e- 1	3.00000 e- 1	9.84971 e- 1
9.82000 e- 1	4.00000 e- 1	9.86144 e- 1
9.82000 e- 1	5.00000 e- 1	9.87445 e- 1
9.84000 e- 1	1.00000 e- 1	9.84815 e- 1
9.84000 e- 1	2.00000 e- 1	9.85693 e- 1
9.84000 e- 1	3.00000 e- 1	9.86646 e- 1
9.84000 e- 1	4.00000 e- 1	9.87690 e- 1
9.84000 e- 1	5.00000 e- 1	9.88848 e- 1
9.86000 e- 1	1.00000 e- 1	9.86715 e- 1
9.86000 e- 1	2.00000 e- 1	9.87484 e- 1
9.86000 e- 1	3.00000 e- 1	9.88319 e- 1
9.86000 e- 1	4.00000 e- 1	9.89234 e- 1
9.86000 e- 1	5.00000 e- 1	9.90249 e- 1
9.88000 e- 1	1.00000 e- 1	9.88614 e- 1
9.88000 e- 1	2.00000 e- 1	9.89275 e- 1
9.88000 e- 1	3.00000 e- 1	9.89992 e- 1
9.88000 e- 1	4.00000 e- 1	9.90777 e- 1
9.88000 e- 1	5.00000 e- 1	9.91648 e- 1

k^*/k	f	R
9.90000 e- 1	1.00000 e- 1	9.90513 e- 1
9.90000 e- 1	2.00000 e- 1	9.91064 e- 1
9.90000 e- 1	3.00000 e- 1	9.91663 e- 1
9.90000 e- 1	4.00000 e- 1	9.92318 e- 1
9.90000 e- 1	5.00000 e- 1	9.93044 e- 1
9.92000 e- 1	1.00000 e- 1	9.92411 e- 1
9.92000 e- 1	2.00000 e- 1	9.92853 e- 1
9.92000 e- 1	3.00000 e- 1	9.93333 e- 1
9.92000 e- 1	4.00000 e- 1	9.93858 e- 1
9.92000 e- 1	5.00000 e- 1	9.94439 e- 1
9.94000 e- 1	1.00000 e- 1	9.94309 e- 1
9.94000 e- 1	2.00000 e- 1	9.94641 e- 1
9.94000 e- 1	3.00000 e- 1	9.95001 e- 1
9.94000 e- 1	4.00000 e- 1	9.95396 e- 1
9.94000 e- 1	5.00000 e- 1	9.95832 e- 1
9.96000 e- 1	1.00000 e- 1	9.96206 e- 1
9.96000 e- 1	2.00000 e- 1	9.96428 e- 1
9.96000 e- 1	3.00000 e- 1	9.96669 e- 1
9.96000 e- 1	4.00000 e- 1	9.96932 e- 1
9.96000 e- 1	5.00000 e- 1	9.97224 e- 1
9.98000 e- 1	1.00000 e- 1	9.98103 e- 1
9.98000 e- 1	2.00000 e- 1	9.98214 e- 1
9.98000 e- 1	3.00000 e- 1	9.98335 e- 1
9.98000 e- 1	4.00000 e- 1	9.98467 e- 1
9.98000 e- 1	5.00000 e- 1	9.98613 e- 1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0.954
0.952
0.950
$R = \frac{1 - e^{-k^* t}}{1 - e^{-kt}}$
0
0.1
0.2
0.3
0.4
0.5
$f = 1 - e^{-kt}$

Figure 6

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