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Supporting Information

Metal Ion Catalysis in the β -Elimination Reactions of N-[2-(4-pyridyl)ethyl]quinuclidinium and N-[2-(2-pyridyl)ethyl]quinuclidinium in aqueous solution

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Table S1. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 5.19, in OH⁻/H₂O at 50°C, μ = 1 M (KCl).

$[\text{Zn}^{++}]$	$10^6 k_{\text{obs}}$
M	s^{-1}
0	1,42
0,0039	2,27
0,0061	2,49
0,0110	2,78
0,0170	3,32
0,0220	3,56
0,0310	3,72
0,0350	3,69

Table S2. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 5.30, in OH⁻/H₂O at 50°C, $\mu = 1 \text{ M}$ (KCl).

$[\text{Zn}^{++}]$ M	$10^6 k_{\text{obs}}$ s^{-1}
0	1,35
0,0039	2,05
0,0063	2,09
0,0078	2,53
0,0120	2,87
0,0160	2,96
0,0196	3,36
0,0240	3,32
0,0290	3,96
0,0330	3,59
0,0390	3,87

Table S3. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 5.60, in OH⁻/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Zn}^{++}]$ M	$10^6 k_{\text{obs}}$ s^{-1}
0	1,18
0,0033	2,03
0,0041	1,98
0,0083	2,17
0,0100	3,01
0,0140	3,27
0,0150	3,15
0,0200	3,59
0,0240	3,08
0,0270	3,73

Table S4. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 5.90, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Zn}^{++}]$ M	$10^6 k_{\text{obs}}$ s^{-1}
0	1,08
0,0040	2,15
0,0060	2,47
0,0080	2,93
0,0100	3,02
0,0120	3,68
0,0160	4,14
0,0200	4,56
0,0260	4,56
0,0300	4,49
0,0350	4,41

Table S5. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 6.20, in OH⁻/H₂O at 50°C, μ = 1 M (KCl).

$[\text{Zn}^{++}]$ M	$10^6 k_{\text{obs}}$ s^{-1}
0	1,02
0,0039	2,07
0,0059	2,31
0,0078	2,97
0,0086	2,91
0,0120	3,68
0,0196	4,04
0,0260	4,35
0,0330	4,72
0,0350	4,55

Table S6. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(4-pyridyl)ethyl]quinuclidinium (**1**) at pH = 6.35, in OH⁻/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Zn}^{++}]$ M	$10^6 k_{\text{obs}}$ s^{-1}
0	1,00
0,0039	2,09
0,0061	2,23
0,0080	2,99
0,0110	3,45
0,0170	4,28
0,0220	4,87
0,0310	4,13

Table S7. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.26, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Zn}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,30
0,0060	3,20
0,0098	3,89
0,0100	3,81
0,0198	6,50
0,0370	9,25
0,0395	12,01
0,0400	9,30
0,0711	15,46
0,0740	14,18
0,0988	17,34
0,1020	16,79
0,1380	18,66
0,1430	18,55
0,1960	19,43
0,1960	18,74

Table S8. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.60, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Zn}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,17
0,0064	3,15
0,0079	4,32
0,0110	4,33
0,0110	4,36
0,0160	6,28
0,0230	6,61
0,0240	7,76
0,0298	8,67
0,0396	10,53
0,0400	9,24

Table S9. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.90, in OH⁻/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Zn}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,12
0,0058	3,24
0,0099	4,13
0,0100	4,36
0,0160	4,95
0,0210	6,70
0,0240	6,53
0,0300	9,27
0,0360	9,76
0,0400	9,95

Table S10. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Zn}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 6.20, in OH/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Zn}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,08
0,0040	2,78
0,0059	3,72
0,0060	3,53
0,0079	4,24
0,0082	4,06
0,0099	4,86
0,0102	4,86
0,0198	6,73
0,0205	6,65

Table S11. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.29, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Cd}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,28
0,0299	2,13
0,0597	2,95
0,0995	3,66
0,1274	3,79
0,1592	4,77
0,1990	5,69

Table S12. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.62, in OH/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Cd}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,16
0,0299	2,22
0,0597	3,36
0,0995	3,89
0,1313	4,45
0,1592	4,71
0,1950	5,92

Table S13. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 5.93, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Cd}^{++}]$	$10^7 k_{\text{obs}}$
M	s^{-1}
0	1,10
0,0298	1,98
0,0580	2,51
0,0994	3,20
0,1283	4,02
0,1615	4,67
0,2030	6,14

Table S14. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 6.10, in $\text{OH}^-/\text{H}_2\text{O}$ at 50°C , $\mu = 1 \text{ M}$ (KCl).

$[\text{Cd}^{++}]$	$10^7 k_{\text{obs}}$
M	s^{-1}
0	1,09
0,0310	1,71
0,0590	2,19
0,0980	3,09
0,1310	3,73
0,1600	4,63

Table S15. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 6.20, in OH⁻/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Cd}^{++}]$ M	$10^7 k_{\text{obs}}$ s^{-1}
0	1,08
0,0305	1,48
0,0609	2,37
0,1015	3,17
0,1299	4,16
0,1583	4,42
0,1989	5,52

Table S16. Dependence of pseudo-first order rate constants, k_{obs} , s^{-1} , on $[\text{Cd}^{++}]$, M, with N-[2-(2-pyridyl)ethyl]quinuclidinium (**2**) at pH = 6.21, in OH⁻/H₂O at 50°C, $\mu = 1$ M (KCl).

$[\text{Cd}^{++}]$	$10^7 k_{\text{obs}}$
M	s^{-1}
0	1,08
0,0301	2,02
0,0602	2,56
0,0989	3,95
0,1290	4,12
0,1591	4,80
0,2110	5,71