Using E^o values to work out the feasible reaction

AIMS

1. Will Mn react with Fe^{2+}?

   YES

2. Will Ag react with Cu^{2+}?

   NO

3. Will Ag^+ react with Cu^{2+}?

   NO

4. Will Br_2 react with Cl^-?

   NO

← more −ve

Electrode			E^o/ V
$Mn^{2+} + 2e^- \rightleftharpoons$		Mn	−1.19
$Zn^{2+} + 2e^- \rightleftharpoons$		Zn	−0.76
$Fe^{2+} + 2e^- \rightleftharpoons$		Fe	−0.44
$Ni^{2+} + 2e^- \rightleftharpoons$		Ni	−0.25
$H^+ + e^- \rightleftharpoons$		$½ H_2$	0
$Cu^{2+} + 2e^- \rightleftharpoons$		Cu	+0.34
$Ag^+ + e^- \rightleftharpoons$		Ag	+0.80
$½ Br_2 + e^- \rightleftharpoons$		Br^-	+1.09
$½ Cl_2 + e^- \rightleftharpoons$		Cl^-	+1.38

more +ve →

2 small points...

1. *feasible*
2. *standard*

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1. Will Ni^{2+} react with Zn?
2. Will Ni^{2+} react with Cl_2?
3. Will Ni^{2+} react with Cl^-?

← more −ve

Electrode			E^o/ V
Mn^{2+}	+ 2e⁻ ⇌	Mn	−1.19
Zn^{2+}	+ 2e⁻ ⇌	Zn	−0.76
Fe^{2+}	+ 2e⁻ ⇌	Fe	−0.44
Ni^{2+}	+ 2e⁻ ⇌	Ni	−0.25
H^+	+ e⁻ ⇌	½ H_2	0
Cu^{2+}	+ 2e⁻ ⇌	Cu	+0.34
Ag^+	+ e⁻ ⇌	Ag	+0.80
½ Br_2	+ e⁻ ⇌	Br^-	+1.09
½ Cl_2	+ e⁻ ⇌	Cl^-	+1.38

more +ve →

answers: yes, no, no

References

Nuffield Advanced Science, *Book of Data* (1984). Longman.
Jim Clark, *Calculations in AS/A Level Chemistry* (2000). Pearson Education.