Basic principles: Electrochemical voltage series

The basis of the storage of electrical energy in secondary elements (accumulators) and direct generation in primary elements (“batteries”) is the standard electrode potential of each element as represented in the table of electrochemical voltage series. The voltage between a hydrogen electrode and an electrode consisting of another chemical element under normal conditions* is the standard potential of this chemical element. The more positive the voltage, the more inert the element is, and the more negative the voltage the less inert (baser) the element is in its particular reduction or oxidation stage. The inert metals gold or platinum, for example, lose electrons extremely reluctantly, in other words they are highly inert and have a very positive standard potential. The metal lithium on the other hand loses electrons quite readily, in other words it is non-inert (base) and has a strongly negative standard potential. Important: The negatively charged fluorine or bromine atoms (ions) do not lose electrons very readily either, in other words they behave like a noble metal.
If you combine electrodes made from two different materials you get an electric current source with a voltage that corresponds exactly to the difference between the standard potentials (for example, lithium with hydrogen 3.05 V). Important: Since the potentials are also dependent on the concentration it is not possible to calculate the battery or accumulator voltage directly from the electrochemical voltage series.

Element	Reduced form	Oxidized form	Electron exchange	Standard potential* E °
Fluorine (F)	2 F^-	F_2	2e^-	+2.87 V
Gold (Au)	Au	Au^+	e^-	+1.69 V
Platinum (Pt)	Pt	Pt^{2+}	2e^-	+1.20 V
Bromine (Br)	2 Br^-	Br_2	2e^-	+1.07 V
Mercury (Hg)	Hg	Hg^{2+}	2e^-	+0.85 V
Silver (Ag)	Ag	Ag+	e^-	+0.80 V
Copper (Cu)	Cu	Cu^{2+}	2e^-	+0.34 V
Hydrogen (H_2)	**H_2**	**2 H^+**	**2e^-**	**0 V**
Iron (Fe)	Fe	Fe^{3+}	3e^-	−0.04 V
Tin (Sn)	Sn	Sn^{2+}	2e^-	−0.14 V
Nickel (Ni)	Ni	Ni^{2+}	2e^-	−0.23 V
Cadmium (Cd)	Cd	Cd^{2+}	2e^-	−0.40 V
Iron (Fe)	Fe	Fe^{2+}	2e^-	−0.41 V
Sulfur (S)	S^{2-}	S	2e^-	−0.48 V
Zinc (Zn)	Zn	Zn^{2+}	2e^-	−0.76 V
Aluminum (Al)	Al	Al^{3+}	3e^-	−1.66 V
Magnesium (Mg)	Mg	Mg^{2+}	2e^-	−2.38 V
Sodium (Na)	Na	Na^+	e^-	−2.71 V
Lithium (Li)	Li	Li^+	e^-	−3.05 V

* Standard potentials under normal conditions: 25 °C; 101.3 kPa; pH = 0; ion activity 1 (concentration!).