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Effect of Co content on electrochemical hydrogen kinetics properties of single-phase BCC-type $MgAlTiCo_xNi$ high entropy alloys used as a negative electrode in basic and acidic electrolyte

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Highlights

- Increasing Co content on the $MgAlTiCo_xNi$ HEAs reduces the lattice *a*-parameter.
- Cobalt catalyzes the formation of TiH_x during the MA of the $MgAlTiCo_xNi$ HEAs.
- The high Co content improves hydrogen diffusion on $MgAlTiCo_xNi$ HEAs.
- Lattice *a*-parameter of $MgAlTiCo_xNi$ HEAs is associated with discharge capacity.