Lemma 4.7: ($\tilde{V}_K(T_h)$-boundedness)
Let $\beta = -1, 0, +1$; T_h-reg. *
Then the bilinear form $a_h(\cdot,\cdot)$ is $\tilde{V}_K(T_h)$-cont.,
i.e. $\exists\, \mu_4 \neq \mu_4(h)$:

(8) $a_h(v, w) \le \mu_4 \|v\|_h \|w\|_h \quad \forall v, w \in \tilde{V}_K(T_h)$

Proof: mns

Corollary 4.8.:
Under the assumptions of Lemma 4.5.,
the DG scheme $(4)_h$ has a unique solution.

Proof: follows from the Lax-Milgram Lemma.
q.e.d.